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## **SOLAR ENERGY FREQUENTLY ASKED QUESTIONS**

### **Why is there suddenly so many solar projects being proposed in the Hudson Valley?**

New York has adopted an ambitious target known as the Renewable Energy Standard, or “50x30,” which is incentivizing the development of renewable energy in order to reach a goal to have 50% of the state’s total energy supply come from such sources. The 50x30 target is part of the state’s strategy to reduce greenhouse gas emissions to 40% from 1990 levels by 2030, and 80% by 2050, to reduce climate change impacts. The Hudson Valley is already seeing the impacts of climate change, and the accelerated development of renewable energy is necessary to help protect the Valley. One of the primary benefits of reaching the 50x30 target is a reduction in statewide emissions of air pollutants resulting from fuel combustion. This will bring public health benefits from air quality improvements, as well as climate change benefits. New renewable electricity supplies will also provide fuel diversity benefits and limit the State’s reliance on fossil fuels. In addition, renewable energy development is expected to create economic benefits from increased manufacturing of renewable energy equipment, jobs and revenue creation, and spending throughout local economies.

### **How much land is it going to take to meet the 50x30 target for large-scale solar energy?**

It is estimated that between 9,508 MW and 15,403 MW of installed capacity in the form of large-scale renewable energy must be developed in New York State by 2030 to meet projected energy demand and the 50x30 target. The largest portion (approximately 50%) is predicted to be land-based wind energy, with the next-largest portion (15-20%) made up of utility-scale solar, and the remainder comprised of hydropower, biomass, offshore wind, and imports.

The acreage of land required to meet this level of utility-scale solar development is very small, compared to the total amount of land in the state. Statewide, between 2,736 and 6,032 MW of utility-scale solar energy capacity is expected to be installed. Based on a 2014 NYSERDA study which found that solar energy requires two acres per MW capacity, this means that between 5,472 and 13,730 acres is required; this is only 0.02 to 0.04% of the State’s total land area of approximately 35 million acres.

### **What is solar energy?**

Solar photovoltaic energy, also known as “PV” or “solar electric,” directly converts the energy radiated by the sun as electromagnetic waves into energy by means of solar panels. Individual solar cells, each made from semiconductor materials, connect together to form solar electric modules and produce electricity. These solar modules, in turn, combine and connect to form solar electric arrays.

### **What are solar energy facilities made of?**

Solar PV arrays are typically made up of panels of silicon solar cells covered by a thin layer of protective glass, which is attached to an inert solid underlying substance. Solar panels are comprised of many, smaller units called photovoltaic cells. Many cells linked together make up a solar panel. Silicon is what is known as a semi-conductor, meaning that it shares some of the properties of metals and some of those of an electrical insulator, making it a key ingredient in solar cells.

The standard components of ground-mounted solar installations include photovoltaic (PV) panels, footings and support structures that are driven into the ground, wiring, inverters and foundations, access roads, perimeter fencing, and sometimes maintenance and storage buildings.



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### **How does PV work?**

The term “photovoltaic” means that sunlight is converted into electricity. A solar panel works by allowing photons, or particles of light that come from the sun, to knock electrons free from atoms, generating a flow of electricity. Freeing up electrons is however only half the work of a solar cell: it then needs to herd these stray electrons into an electric current. This involves creating an electrical imbalance within the cell, which acts a bit like a slope down which the electrons will flow in the same direction.

Creating this imbalance is made possible by the internal organization of silicon. Silicon atoms are arranged together in a tightly bound structure. By squeezing small quantities of other elements into this structure, two different types of silicon are created: n-type, which has spare electrons, and p-type, which is missing electrons, leaving ‘holes’ in their place.

When these two materials are placed side by side inside a solar cell, the n-type silicon’s spare electrons jump over to fill the gaps in the p-type silicon. This means that the n-type silicon becomes positively charged, and the p-type silicon is negatively charged, creating an electric field across the cell. Because silicon is a semi-conductor, it can act like an insulator, maintaining this imbalance. As the photons smash the electrons off the silicon atoms, this field drives them along in an orderly manner, providing electric current to power all the things we use that are run by electricity.

### **Is it dangerous?**

The generation of electricity from photovoltaic (PV) solar panels is safe and effective. According to the U.S. Department of Energy, few power-generating technologies have as little environmental impact as PV solar panels. Because PV systems do not burn fossil fuels, they do not produce the toxic air or greenhouse gas emissions associated with conventional fossil fuel fired generation technologies.

Solar panels do not produce heat, emissions, or radiation. Solar panels do not emit electromagnetic (EM) radiation because they produce direct current (DC). Solar installations must have an "inverter" that converts the DC current into alternating current (AC) so that it can be used by household devices or be fed into the grid. This AC current is identical to the current ordinarily used and so produces no additional health risk.

### **Won't it create traffic and noise?**

Depending on the size of the project, noise, dust and visual impacts from large equipment may occur during construction. A project sponsor should include a mitigation plan to minimize impacts on any nearby receptors during construction. Once solar farms are installed and the solar project is operational, there will be little activity on the site. Solar projects generate power with few or no moving parts and make very little noise.

### **How much water does it use?**

Water is not required for operation of a solar facility. Some amount of water may be used for controlling dust during construction and for periodic panel washing, which may occur 1-2 times per year, depending on site conditions.

### **Won't it kill birds?**



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The type of solar projects that are built in the northeast are not harmful to birds.

The type of solar facility that has been known to harm birds is known as thermal solar, or concentrating solar, which generates electricity by focusing solar rays to transform a fluid into steam. That steam then turns a turbine to power a generator. Some concentrated solar installations arrange a huge number of mirrors that point to a central tower, and the concentrated solar towers create an incredibly high-heat area that's dangerous for anything to touch. When birds fly through or touch such a facility, they can be burned. These projects are typically located in areas with very high solar insolation, such as the deserts of the American southwest.

### **Won't it ruin the view?**

Solar projects can be sited and designed to avoid and minimize any visual contrasts or impacts, by avoiding siting on important designated viewsheds and using techniques such as siting below tree-lines and planting vegetative screening.

### **Won't it lower my property value?**

Studies have shown that solar panels installed on homes actually increase their value.

Because there are relatively few large- and utility-scale solar projects in New York, there is little research on the issue of their impact on adjacent property. As a comparison, research on whether wind power projects impacted residential property values in the US found that no conclusive evidence of the existence of any widespread property value impacts that might be present in communities surrounding wind energy facilities. Specifically, neither the view of the wind facilities nor the distance of the home to those facilities is found to have any consistent, measurable, and statistically significant effect on home sales prices. Because a solar farm is safe, does not create any emissions, and is quiet, they do not result in any impacts that could impact property values.

### **Will it be tax exempt?**

A solar project is normally required to pay permitting fees for the review process like any other development project. Under New York Real Property Tax Law § 487, there is a 15-year real property tax exemption for New York properties with renewable energy systems, including solar systems, which applies to the value that a solar electric system adds to the overall value of the property. Under the law, jurisdictions may negotiate payments in lieu of taxes (PILOTS), whereby the tax burden and rate uncertainty is reduced, but some of the forgone revenue from property taxes are preserved. A jurisdiction may opt out of the exemption, and tax large projects at full value.

### **How long will it last?**

The lifespan of a solar project is generally 20-30 years, and proper maintenance can help to maximize its longevity.

### **What happens when it becomes obsolete?**

Solar project developers are generally required to have a decommissioning plan for the solar farm. When the solar project has reached the end of its life, all structures and equipment should be removed. When designing the project, measures can be implemented to ensure that the project does not have any negative permanent impacts on the land, and it can be returned to its previous or another beneficial use.



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#### Resources:

[https://www.nrel.gov/tech\\_deployment/state\\_local\\_governments/blog/top-five-large-scale-solar-myths](https://www.nrel.gov/tech_deployment/state_local_governments/blog/top-five-large-scale-solar-myths)

<https://training.ny-sun.ny.gov/88-resources/faqs/general-faqs/272-do-solar-installations-have-an-impact-on-property-values>

<http://www.antiochcollege.edu/solar-farm/frequently-asked-questions-about-solar-farm>

[https://www.nexteraenergyresources.com/pdf\\_redesign/Berkeley\\_Property\\_Values\\_Report.pdf](https://www.nexteraenergyresources.com/pdf_redesign/Berkeley_Property_Values_Report.pdf)