

**BLACKS CREEK**  
ENERGY CENTER

FREQUENTLY ASKED QUESTIONS ON GROUND-MOUNTED

# SOLAR PHOTOVOLTAIC SYSTEMS



## Ambient Temperature

### **Does the presence of ground-mounted solar arrays cause higher ambient temperatures in the surrounding neighborhood (i.e., the “heat island” effect)?**

All available evidence indicates that there is no solar “heat island” effect caused by the functioning of solar arrays. Solar panels absorb photons from direct sunlight and convert it to electricity, minimizing the likelihood of substantially changing temperatures at the site or the surrounding neighborhood.

Because solar PV modules are thin and lightweight, they do not store a large amount of heat. This and the fact that panels are shown to cool to ambient air temperature as soon as the sun sets, a study by Sunpower, a private solar manufacturer, concludes that the area surrounding a large-scale solar array is unlikely to experience a net heating change from the panels.<sup>1</sup>

## Cleaning Protocol

### **What is the best way to clean solar panel arrays?**

Panels are cleaned only with water, and no chemicals are used. They are cleaned only a few times a year based on soiling levels. Typically, water is trucked in. However, in the right situation, an arrangement with a participating landowner might be made to use their water supply. Areas that receive significant and regular rainfall can significantly reduce the need for deliberate cleaning of the panels.

### **If it snows, does the snow need to be actively removed from the panels?**

Snow can serve as a natural cleaning agent that wipes away any dirt as it melts and slides away. In most cases, snow removal is unnecessary, but operations and maintenance personnel will monitor the solar panel array and can remove snow if necessary.

## Cost of Power

### **Will a solar project in my community lower my utility bills?**

An important benefit of solar power to ratepayers is that it provides a long-term hedge against increasing prices because it does not consume any fuel and allows utilities to purchase energy at stable long-term rates. This may help to reduce future increases in electricity prices. This saves money for ratepayers in the long term. Once built, this solar project will be an important contributor to the county’s tax base, providing more money for schools and essential government services such as first responders.

## End-of-Life Decommissioning

### Can solar panels be recycled at the end of life?

According to Green Tech Media Research, modern photovoltaic crystalline silicon panels (PV panels) are largely composed of glass (76%) and also include plastic (10%), aluminum (8%), silicon (5%), and very small amounts of copper, silver, tin, and lead (collectively, 1%).

Nearly 85% of the materials in PV solar panels are fully recyclable at the end of the project's life. Importantly, 100% of the metals in solar panels are reusable. The 10% plastic component of the panels is consumed in the recycling process, so less than 6% of the total panel materials may actually need to be disposed of at a regulated waste facility.

In addition to environmental reasons for responsible disposal of PV panels, solar operators have economic incentives to reuse and recycle PV panels at the end of the project life. While the percentage of PV panels that can be recycled varies based on the type of panel and recycling process used, approximately 85% of PV solar panels are fully recyclable. In general, glass and metal components are entirely reused to make new solar panels. Plastic components melt, evaporate, and are then reused as a heat source in the recycling process.

## Efficiency

### Where does the power go?

Think of solar energy just like the other crops, like corn, wheat, and dairy that are currently harvested in your community. While some of those resources stay local, many are shipped outside your community but provide valuable income and jobs locally. Solar energy is no different. While it is impossible to know where exactly the electrons flow once they enter the electrical grid, the benefits from producing that energy, such as tax revenues created, stay local.

### Do solar panels still work on a cloudy day?

Before constructing any solar project, we evaluate historical meteorological data to determine the facility's expected output. Photovoltaic panels can use direct or indirect sunlight to generate power, though they are most effective in direct sunlight. Solar panels will still work even when the light is reflected or partially blocked by clouds.<sup>4</sup>

### How will the project produce energy through the winter and on cloudy days?

The project will produce energy throughout the year, even on cloudy days. And while the output will be maximized on clear, sunny days, even when there are clouds in the sky, there is still solar radiation hitting the solar panels as the sunshine gets through the clouds.

Modern panels feature technology that uses bifacial modules meaning they can produce electricity by absorbing sunshine radiation on the front and rear sides of the panels. The modules' rear side absorbs sunshine radiation reflected from the ground. When there is snow on the ground, the additional sunshine reflecting off the snow amplifies the sunshine radiation absorbed from the ground.

## Health / Materials

### **Can chemicals that might be contained in solar PV threaten public drinking water systems and/or wetland resources?**

All solar panels are contained in a solid matrix, are insoluble, and are enclosed. Therefore, releases are not a concern. Rules are in place to ensure that ground-mounted solar arrays are installed in a way that protects public water supplies, wetlands, and other water resource areas.<sup>1</sup>

### **Are there health risks from the electric and magnetic fields (EMF) from solar panels?**

Solar energy produces no emissions, waste, odor, or byproducts. The extremely low-frequency EMF from PV arrays and transmission lines is the same as the EMF people are exposed to from household electrical appliances and wiring in buildings.

### **Can solar panels be damaged by hail and strong winds?**

Solar panels are designed to withstand extreme weather, including hail and thunderstorms. However, just like your car windshield can get damaged, the same can happen to solar panels, although it is very rare. If a solar panel were to become damaged from severe weather or any other reason, it would likely be the glass that has become damaged, and there would be no risk of exposure to the contents. The Savion team has plenty of experience developing solar projects in high-wind zones. Our projects have shown to be virtually undamaged by direct hits from CAT 3 storms in the past. But, even if something were to hit the area and damage the solar panels, the solar farm will be well insured with plans to make repairs.

### **Will a solar farm create stormwater runoff and water drainage issues?**

In many situations, during the development phase of a solar project, drainage studies and calculations may be conducted by third-party experts. It is typical to find that a solar project area's post-construction condition will create less stormwater runoff than the current pre-construction condition of cultivated ad land. Ecological benefits are expected to accrue over time from the temporary but long-term conversion of agricultural land to native plant communities. Native plant species tend to have deeper and more complex root systems, which allows for improved water absorption and retention than in soil on agricultural land. As a result, erosion and stormwater runoff will be reduced.

## Hunting

### **How will solar PV arrays impact deer or other hunting?**

During construction, there is possibly a temporary impact on uses to areas adjacent to the project. Once operational, there is very little activity at a solar project, and deer and other wildlife quickly return. It's not a matter of deer staying away; it's more a matter of keeping them out of the solar facility area where they like to graze on the grasses. Hunting outside the project area is not affected, and the presence of the solar project does not impact the hunting rights of non-participating landowners.

## Public Safety

### **What public safety issues arise from accessing areas where solar arrays are installed? Can electrical and other solar-related equipment cause fires?**

Large-scale ground-mounted arrays are enclosed by fencing. This prevents children and the general public from coming into contact with the installations, thus preventing unsafe conditions. The National Electric Code has mandatory requirements for the electrical safety of solar PV arrays. It requires that conductors, which are part of solar PV arrays, be installed so they are not readily accessible. In addition, warning signs and sometimes alarm systems are installed to deter unauthorized individuals from entering the solar array area.

Only a small portion of the materials in the panels are flammable, and those components cannot self-support a significant fire. The flammable components of PV panels include the thin layers of polymer encapsulates surrounding the PV cells, polymer back sheets (framed solar panels), plastic junction boxes, and insulation on wiring. The rest of the panel is composed of non-flammable components, including the layers of protective glass that make up three-quarters of the panel's weight.

## Solar Panel Design / Visual Impacts

### **What are the visual impacts of the solar array once constructed?**

Large solar projects have similar characteristics to a greenhouse or single-story residence. They are often enclosed by fencing and/or landscaping to minimize visual impacts.

### **How high are the panels off the ground? How tall do the panels stand?**

Solar panels sit approximately five feet off the ground, depending on site conditions. Considering the latest solar panel size is 51 inches wide x 94 inches tall, the approximate total height of the panel at its maximum rotation angle is eight to nine feet.

### **How important are reflectivity and potential visual impacts from solar projects, especially near airports?**

Solar panels are designed to absorb and convert solar energy into electricity. They reflect only about 2 percent of incoming light, so issues with glare from PV panels are rare. Solar module glass has less reflectivity than water or window glass, and reflected light from solar panels will have a significantly lower intensity than the glare from direct sunlight. Many projects throughout the U.S. and the world have been installed near airports with no impact on flight operations. There have been no U.S. aircraft accident cases in which glare caused by a solar energy facility was cited as a factor. Proper siting procedures can ensure panels are placed to minimize any potential glare to surrounding areas.<sup>1</sup>

### **Why was this area selected for a solar project?**

The project area is suitable for utility-scale solar facility development based on the following factors: proximity to available transmission capacity, significant energy demand within the electrical grid, landowner and community interest, significant local economic benefits, and a form of development that maintains the rural character of this area.

## Sound

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### How does the sound of large solar projects impact nearby residential and agricultural properties?

Solar projects are effectively silent, except for the tracking motors and inverters that might produce an ambient hum. This is typically not audible from outside the project enclosure.

## Property Values

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### Do ground-mounted solar PV arrays negatively impact property values?

According to the Solar Energy Industries Association (SEIA), large-scale solar arrays often have no measurable impact on the value of adjacent properties. A review of literature nationwide shows little evidence that solar arrays influence nearby property values, which makes sense because once operational, solar projects are quiet facilities that generate little traffic (post-construction), create minimal sound, and produce no emissions.

*1 Massachusetts Department of Energy Resources; Massachusetts Department of Environmental Protection; Massachusetts Clean Energy Center June 2015*

*4 Solar Energy Industries Association (SEIA), 2021*