PLANO SKIES
SOLAR PROJECT

FREQUENTLY ASKED QUESTIONS ON GROUND-MOUNTED

SOLAR PHOTOVOLTAIC SYSTEMS

Ag Land Use

Do solar power facilities in rural areas take farmland out of agricultural commission permanently?

The use of ag land for a solar energy facility is only temporary, and the land can be restored to its original condition after the solar farm is decommissioned. Compared to other forms of development where farmland is paved over (for shopping centers, amusement parks, manufacturing facilities, suburban housing tracts, highways), a de-commissionable solar farm is a far more favorable option.[3]

- The total amount of agricultural land being used for solar energy is minuscule compared to the conversion of agricultural land permanently to residential housing and commercial development.[3]
- In the arrangements where a landowner has agreed to lease property to the solar project, the ongoing annual lease payments will continue to go to the landowner, who will retain ownership of the land both during and after the lease. At the end of the lease and when the project is responsibly decommissioned, the landowner could resume farming the land. In other development conversions, the land is sold by the farmer to another party – usually a housing developer or commercial real estate broker.[3]
- Solar farms present landowners with an opportunity for a higher value use on their land. This also allows the landowner to diversify their income away from agricultural products alone, better weather economic downturns, and keep the land in the family.[3]
- Farmland has gotten more productive over the years with better farming equipment and techniques resulting in higher yields on the same amount of land. This is also due to improvements in seed varieties, fertilizers, pesticides, machinery, reduced tillage, irrigation, crop rotations, and pest management systems.[3]

3 David G. Loomis, Ph.D. (2020). Economic Impact and Land Use Analysis of Mark Center Solar. Bloomington: Strategic Economic Research.

How much farmland is utilized by a solar project?

Only a portion of farmland is suitable for solar energy generation. According to the National Renewable Laboratory (NREL), if the United States were to meet 100% of its electricity needs with solar energy, it would require about 0.6% of America's total land area. (Solar Energy Industries Association (SEIA), 2019)

Solar projects give farmers and landowners an opportunity to utilize their land to harvest another stable cash crop—the sun. Many farmers who host a solar project have not made the choice to give up farming completely, but rather have taken a small acreage out of agricultural production for renewable energy production. For some landowners, this can be a hedge against shifting commodity prices that can sustain the rest of their agricultural production.

In fact, solar projects allow land to recover by letting the soil rest. In the future, when a solar project is decommissioned, farming can once again resume on that land. This is a stark contrast to other development, which often leaves land unable to easily convert back to agricultural use. (Solar Energy Industries Association (SEIA), 2019)

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.[1]

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

Sound

Is there sound associated with the solar project?

Solar projects have little to no sound audible outside of the fence line of the project. Inverters and transformers make a humming sound during the day, when the array generates electricity. Any sound will be inaudible at the fence line. Sound impacts can be mitigated through the use of proper siting procedures. Transportation and maintenance equipment, like cars, trucks, lawnmowers, and string trimmers are common sources of sound on solar projects that most people are accustomed to hearing elsewhere. Construction of a solar project is 9-12 months.[1]

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

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

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.

End-of-Life Decommissioning

How are solar panels managed after they are no longer in use? Can they be recycled, and do hazardous waste disposal requirements apply?

The average life of solar PV panels can be 20-30 years or longer after initial installation. At the time of decommissioning, panels may be reused, recycled, or disposed of. There are a few different types of solar panels used in ground-mounted PV systems. Solar module manufacturers typically provide a list of materials used in their product, which may be used to determine the proper disposal requirements at the time of decommissioning.[1]

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

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?

Prior to constructing any solar project, we evaluate historical meteorological data to determine what the expected output of the facility will be. 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.[4]

4 Solar Energy Industries Association (SEIA), 2021

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

The project will be able to produce energy throughout the entire 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 on the front and rear side of the panels so they can absorb radiation to generate electricity. So, the rear side of the modules absorbs sunshine radiation that is reflected from the ground. When there is snow on the ground, it emphasizes 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.[1]

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

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.

Hunting

How will solar PV arrays impact deer or other hunting?

During construction, it is possible there would be 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 hunting rights of non-participating landowners are not impacted by the presence of the solar project.

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, and 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.

Property Values

How do ground-mounted solar PV arrays adjacent to residential neighborhoods influence the property values in those neighborhoods?

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, with minimal traffic and no sound or emissions.[1]

A 2014 study completed in Chatham County, North Carolina, concluded that the nearby presence of solar facilities had no impact on the value of homes, agricultural land, or vacant residential land. When possible and feasible, project developers can work with project stakeholders to include screening vegetation along the site borders to minimize visual impacts on surrounding neighborhoods.[1]

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

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

The American Society of Farm Managers & Rural Appraisers posted a blog on February 16, 2021 that summarized the findings of several studies on solar impact on rural property values. In addition, it featured the conclusions of four land appraisal experts on the same topic. The studies and experts reported no known consistent negative impacts on rural area property values due to solar. Especially when developers work with landowners and residents to properly site and conceal solar farms from view. *(https://www.asfmra.org/blogs/asfmra-press/2021/02/16/solars-impact-on-land-values)*

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, be installed to not be readily accessible.[1]

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 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 backsheets (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.[2]

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

2 NC Clean Energy Technology Center. North Carolina State University. Health and Safety Impacts of Solar Photovoltaics white paper. 2017

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 4’ off the ground, depending on site conditions. Considering a common solar panel size is 36” x 66”, the approximate total height of the panels at the highest point is typically 7-8’ but not exceeding a height of 10’.

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

Solar panels are designed to absorb solar energy and convert it 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 glare from direct sunlight. Many projects throughout the U.S. and the world have been installed near airports with no impact on flight operation. 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 in a way that minimizes any potential glare to surrounding areas.[1]

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

How does the traffic associated with large solar projects impact nearby residential and agricultural property?

During construction, there will be increased traffic associated with the construction activities. However, once the construction is complete, and the site is operational, there will only be 1-2 vehicular trips per day to and from the site.

Cleaning Protocol

What is the best way to clean solar panel arrays?

The most effective way to clean solar panels is with natural weather sources such as rain. Should lack of rain or extreme dust conditions warrant cleaning, a water truck is typically used to wash dirt and natural buildup from 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 not necessary, but there will be operations and maintenance personnel monitoring the solar panel array and can remove snow if necessary.