

Location Considerations for Ground-Mounted Solar Photovoltaic Arrays



The Massachusetts Department of Energy Resources has established the Solar Massachusetts Renewable Target (SMART) program, which will regulate incentives associated with new solar photovoltaic (PV) development in the state, beginning November 26, 2018. A series of fact sheets designed to help farmers navigate the program is available on the UMass Clean Energy Extension (CEE) website, <https://ag.umass.edu/clean-energy>.

There are many factors that go into choosing the right location for a ground-mounted PV system on your farm. A solar developer or installer can work with you to determine the best site for a ground-mounted solar PV array, but it is important to have a sense of what characteristics should be considered when choosing a site. Some important considerations include:

Land Status

The SMART program regulates solar development differently based on a property's status in terms of zoning, previous development, and other factors. In order to determine what financial compensation a solar development on your land may be eligible for, and what restrictions may apply, you must determine if your land 1) is within the Chapter 61A program, or has been within the last five years, 2) is located on Prime Farmland Soils, 3) is zoned for industrial or commercial development, 4) has been previously developed, as with construction or paving, and 5) is sited within a solar overlay district designated by your town for zoning purposes. If your land is under an Agricultural Preservation Restriction (APR) or part of the Farm Viability Enhancement Program (FVEP), additional restrictions also apply.

Land Quality

In most cases, shading from solar panels is expected to decrease crop yields to a greater or lesser extent. It is likely not in your best interest to locate panels on your most productive farmland. Certain types of agricultural use, like sheep pasture, may be less affected by solar panels.

Interconnection Distance

Your solar array must connect to the electric grid, in order to be eligible for financial compensation through the SMART program. Interconnection costs can be quite high for large systems, and interconnection distance is perhaps the most important site consideration for solar developers. Appropriate sites must be near a 3-phase electric distribution line (ideally less than 2000 feet), which has spare capacity and appropriate voltage. This is something a solar developer or installer will investigate in consultation with your local electricity utility.

The Massachusetts Clean Energy Center and several Massachusetts utilities have developed interconnection guidance.

- MassCEC Interconnection Guide:
<http://files.masscec.com/uploads/attachments/InterconnectionGuideforDistributedGeneration.pdf>
- National Grid Interconnection Process:
https://www9.nationalgridus.com/masselectric/home/energyeff/4_interconnection-process.asp
- Eversource – Massachusetts Application to Connect:
<https://www.eversource.com/content/wma/about/about-us/doing-business-with-us/builders-contractors/interconnections/massachusetts-application-to-connect>

Accessibility

Is the property easily accessible from the road? Heavy equipment will need to enter the site to install the solar array racking system, panels, and transformers. Once the array is active, it becomes a regulated electric generation facility that must meet and maintain safety standards. Your local fire marshal will need to approve a fire safety plan that enables appropriate vehicles and equipment access to the site in case of fire. The solar array may also require fencing for safety reasons. If this is required at your site, it is important to consider whether having a locking gate will pose logistical problems during normal farm operations.

Slope

Most farmland is relatively flat, which is an asset for solar array installation. If you are interested in putting solar on a sloping pasture, or otherwise uneven ground, there may be additional issues and costs associated with array design and installation. Arrays are typically not installed on slopes greater than 20%.

Town Bylaws

Some towns may have specific property line setbacks for solar arrays. The town clerk or mayor's office should have this information on file. If your town is a Green Community, there is a standard As-of-Right Zoning Bylaw which applies to ground-mounted solar PV systems of 250 kW DC capacity or greater. This bylaw streamlines the permitting process for qualifying solar PV arrays within a designated as-of-right zone, which is mapped and on file in the office of the town clerk or comparable city planning department.

Wetlands Regulations

A number of agricultural activities are exempt from requirements of the Massachusetts Wetlands Protection Act (WPA), so you might not be aware if wetland habitats or buffer zones are present on your property. Solar arrays are NOT exempt from WPA regulations, and solar arrays placed in protected wetland resource areas will generally not qualify for financial compensation under the SMART program, although placement in wetland buffer zones may be allowable under some circumstances. Your town Conservation Commission can help you determine if any protected wetlands are present on your property, and if necessary, what modifications would need to be made in design to allow solar development on your property.

The Massachusetts Department of Environmental Protection (MassDEP) has produced a guide to wetlands policy with regard to solar arrays. <https://www.mass.gov/guides/massdep-wetlands-program-policy-17-1-photovoltaic-system-solar-array-review>

MassDEP has also released guidance regarding the development of solar PV arrays on existing cranberry bogs. See:

https://cdn.ymaws.com/www.maccweb.org/resource/resmgr/docs/guidance_on_agriculture_and_.pdf

Proximity to Airports

Solar arrays are a potential hazard for airports and air traffic controllers due to glare. If your land is more than 5 nautical miles from an airport, there is no cause for concern. If your land is closer to an airport, you should check with your local airport to ensure the solar array will not create a problem for air traffic.

The Federal Aviation Administration has a tool on its website where you can enter your latitude and longitude in order to determine if you need to file a notice with the agency.

<https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp>

Aesthetics

Are you or your neighbors going to be looking at the array on a daily basis? Abutters will be informed of the solar installation as part of the permitting process, and it is worth considering their feelings about the project. Screening vegetation may be appropriate in some circumstances.

Newsletter and More Information

To stay up to date on the latest information from UMass Clean Energy Extension, please sign up for our newsletter at <https://ag.umass.edu/clean-energy>.

Contact River Strong (gcstrong@umass.edu, 413-545-8510) with any questions related to solar PV use on your farm.