



Solar Energy

Best Management Practices for Agriculture-Friendly Projects

Whether you're trying to protect prime farmland, minimize impacts to neighboring farm operations, or ensure a solar site can return to productive agricultural use in the future, there are a number of tools and best practices to minimize the impacts of large-scale solar projects on agricultural lands in your community.

This guide was prepared by the Syracuse-Onondaga County Planning Agency (SOCPA) for local governments regulating and reviewing large-scale solar energy systems in Onondaga County. The best practices outlined in this guide are the result of a comprehensive review of available information and other evaluation tools.



SYRACUSE - ONONDAGA COUNTY PLANNING AGENCY

BACKGROUND

According to estimates from the U.S. Energy Information Administration (EIA), electricity generation from solar energy systems increased in the United States from about 5 million kilowatt-hours (kWh) in 1984 to about over 100 billion kWh today. Utility-scale photovoltaic (PV) power plants (systems producing 1 megawatt of solar energy or more) accounted for 64% of the solar electricity generated in the U.S. in 2019.

What are the different types of solar energy systems?

NYSERDA recommends classifying solar energy systems into three tiers for regulatory purposes as follows:

- Tier I: Roof-mounted or building-integrated solar energy systems
- Tier II: Ground-mounted systems that generate up to 110% of electricity consumed on-site over the previous 12 months
- Tier III: Any system not included in the list for Tier I or Tier II.

In comparison to Tier I and II solar energy systems, Tier III systems typically produce electricity for off-site use and are the principle use of a site rather than an accessory use. The guidance in this document is aimed at the regulation and review of large-scale, ground-mounted solar energy systems that fall into the Tier III category or such similar classification defined in local solar regulations.

Did you know?

A solar energy system needs **5 to 10 acres** of land per megawatt (MW) of electricity generated.

That means large-scale solar systems come with significant land area requirements. The characteristics that make a site desirable for solar, i.e. large areas of contiguous, undeveloped land that is relatively flat, are often the same characteristics of good farmland. In Onondaga County, over two-thirds of land area is actively farmed land, forests and open space, with over 150,000 acres in farms alone. Our farm landscapes and vistas are one of the most prized assets in the region. The agriculture industry also contributes significantly to the local economy and rural job opportunities.

So how do we prepare our communities for large-scale solar projects while minimizing impacts to farmland?

LAND USE TOOLS

Preparing for solar projects in your community

Planning

It is important for local governments to establish clear goals for solar energy systems by identifying areas in their community where solar projects are encouraged, as well as areas where solar energy projects would not be a good fit and land preservation for other uses is the priority.

- These goals should be reflected in a local comprehensive plan.
- Other plans that may be adopted by a municipality, in which solar energy goals may be reflected, include:
 - Climate Smart plan
 - Energy plan
 - Agricultural and Farmland Protection plan
 - Open Space Preservation plan

Regulating

Local governments can amend their zoning provisions to reinforce community goals and reduce obstacles to planning approvals and/or permitting for solar energy projects. This is an especially important tool for regulation of large-scale solar energy systems in agricultural areas.

- Solar regulations should clearly define the different types of solar systems that will be permitted in the community and which zoning districts are appropriate for each type.
- Two common tools used to accommodate large-scale solar projects in agricultural areas are:
 - Special Use Permits
 - Site Plan Reviews
- Municipalities can establish conditions for review and approval of a special use permit or site plan application that help minimize impacts to farmland.
- For projects within a NYS Agricultural District, the NYS Department of Agricultural and Markets recommends site plan review.

SPECIAL CONSIDERATIONS: On-farm solar developments in a NYS Agricultural District, which generate energy to meet less than 110% of the anticipated needs of a farm operation, are considered Tier II systems and are protected under NYS Agricultural Districts Law. These types of projects should not be subjected to “overly restrictive” regulations.

- These New York State Solar Guidebook chapters provide additional guidance:
 - Using Special Use Permits and Site Plan Regulations to Allow Large-Scale Solar Installations While Protecting Farmland - <https://www.nyserda.ny.gov/-/media/NYSun/files/special-use-permits-site-plan-regulations.pdf>
 - Solar Installations in Agricultural Districts - <https://www.nyserda.ny.gov/-/media/NYSun/files/understanding-solar-installations-in-ag-fs.pdf>

REVIEW CONSIDERATIONS

Minimizing impacts to agricultural resources

Avoid installation of solar arrays on the most valuable or productive farmland, especially in areas with prime farmland soils or soils of statewide importance

- Types of farmland (in order of productivity):
 1. Active rotational farmland
 2. Permanent hayland
 3. Improved pasture
 4. Unimproved pasture
 5. Other support lands
 6. Fallow/inactive farmland
- For a map of prime farmland soils in Onondaga County, visit:
http://ongov.net/planning/documents/soils_prime_farmland_USDA_2016.pdf

Avoid segmentation of farmland

- Minimize adverse impacts to existing fencing and watering systems.
- Minimize impacts to active farming operations by locating structures for overhead collection lines in nonagricultural areas and along field edges.
- Avoid dividing larger fields into smaller fields that are more difficult to farm.
- Avoid the need for cut and fill and reduce the risk of creating drainage problems by locating access roads that cross agricultural fields along ridge tops and by following field contours.
- Limit the permanent width of access roads in agricultural fields to no more than 16 feet to minimize the loss of agricultural land.
- Avoid existing drainage and erosion control structures.

Protect important community viewsheds

- Identify important viewsheds in the local comprehensive plan and solar regulations.
- Avoid officially designated and publicly accessible scenic areas, including scenic byways, scenic roads, scenic areas of statewide significance, scenic trails, and scenic rivers.
- Minimize visibility from officially designated scenic areas and those aesthetic resources identified at the local level.
- Require a viewshed analysis as a condition for review and approval of a special use permit or site plan application.
- For guidance on evaluating visual and aesthetic impacts, visit:
https://www.dec.ny.gov/docs/permits_ej_operations_pdf/visualpolicydep002.pdf

REVIEW CONSIDERATIONS

Co-locating large-scale solar projects and agricultural uses on the same site

Create a pollinator-friendly landscape

- Plant areas under and around solar arrays with low-growing perennial flowering plants and native grasses to provide habitat for pollinators and birds and preserve the soil for future farming.
- Pollinator habitat creation is beneficial to pollinator-dependent crops on neighboring agricultural lands.
- To be considered a “pollinator friendly” solar development in New York State, vegetation plans must meet the minimum criteria listed here:
https://agriculture.ny.gov/system/files/documents/2020/06/pollinatorhabitatguidelines_0.pdf

Co-locate farm animals

- Allow grazing animals (sheep are highly recommended) to graze under and around solar arrays to maintain vegetation in the project area and continue agricultural use of the land.
- This practice also eliminates the need for mowing within the project area.
- Learn more about the benefits of grazing sheep on solar sites:
https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/c/9310/files/2020/12/Atkinson-Center-report-2018_Final-2213c5n.pdf.pdf

Co-locate crops

- Grow shade tolerant crops, like certain varieties of tomatoes and peppers, under solar arrays to continue food production at a reduced water demand.
- This practice has become known as “agrivoltaics.”
- Learn more about the benefits of co-located agriculture here:
<https://www.nrel.gov/news/program/2019/benefits-of-agrivoltaics-across-the-food-energy-water-nexus.html>

RESOURCES

- Solar Guidebook for Local Governments
<https://www.nyserda.ny.gov/-/media/NYSun/files/solar-guidebook.pdf>
- NYS Department of Agriculture and Markets
Guidelines for Solar Energy Projects - Construction Mitigation for Agricultural Lands
https://agriculture.ny.gov/system/files/documents/2019/10/solar_energy_guidelines.pdf