Illinois Solar Model Ordinance



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Better Energy. Better World.

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Table of Contents

Introduction	1
I. Scope	4
II. Purpose	4
III. Definitions	5
IV. Permitted Accessory Use	7
V. Principal Uses	10
VI. Solar Energy Zoning Incentives	17

Introduction

Illinois has high quality and cost-effective solar energy resources – as good as many states to the south and consistently available across the entire state. As solar energy systems have become more efficient and less costly, market opportunities for solar development, from the rooftop to the solar farm, have dramatically increased in Illinois. Communities must now routinely address solar resources and solar development in land use planning, infrastructure development, zoning standards, and related development issues.

Solar electric generation is now one of the least-expensive means of generating electric energy in Illinois and across the nation. As costs have come down, demand for solar energy has grown substantially. Along with the new market reality, the passage of Illinois's Clean and Equitable Jobs Act (CEJA) in 2021 established a policy commitment to solar energy as a tool for meeting state climate goals. At the Federal level, the Inflation Reduction Act of 2021 created new supportive policies and incentives that are similarly accelerating solar development across the state, in urban areas and rural communities. The combination of market preference and policy support means that the solar development market will continue to grow in the long-term; communities should plan for and regulate solar development just as they do for housing, commercial, industrial, and other kinds of development.

Solar Energy Issues

Consequently, households and businesses are increasingly incorporating solar generation on rooftops and groundmount systems. Agricultural producers are using solar energy as an economic hedge against price volatility in agricultural commodities. Utilities see solar's declining costs as a means to put downward pressure on electric rates. Corporate, institutional, and municipal buyers are actively acquiring carbon-free solar generation to meet climate and clean energy goals. And environmental advocates see innovative habitat-friendly solar site design as a means to restore local ecosystems and water resources.

Local governments have three issues to consider in development regulations:

- 1. Addressing land use conflicts and capturing synergies. Solar energy systems have few nuisances. But solar development can compete for land with other development options, and visual impacts and perceived safety concerns sometimes create opposition to solar installations. Good design and attention to aesthetics can address most concerns for rooftop or accessory use systems. Good siting and site design standards for large- and community-scale solar can similarly resolve conflicts and create co-benefits from solar development such as restoring habitat, diversifying agricultural businesses, and improving surface and ground waters.
- 2. **Protecting access to solar resources.** Solar resources are a valuable component of property ownership. Development regulations can inadvertently limit a property owner's ability to access their solar resources and capture economic benefits. Communities should consider how to protect and enable development of solar resources in zoning, subdivision, and other development regulations or standards.
- 3. **Encouraging appropriate solar development.** Local government can go beyond simply removing regulatory barriers and encourage solar development that provides tax base, economic development, climate protection, and natural resource co-benefits. Local governments have a variety of tools to encourage appropriately sited and designed solar development to meet local goals.

How to Use this Model Ordinance

This Model Ordinance is based on research and best practices identified through working with over 100 Midwestern communities as solar energy markets evolved and expanded and from review of other model ordinances and research conducted across the nation. The standards included in this model reflect the real-world controversies and opportunities that communities face and the solutions that communities considered as the solar energy market grew. This model language and associated guidance provides a reference for how communities can address the controversies and opportunities afforded by an expanding solar energy market. The goal of developing this model is to make solar development more predictable, solar land use regulation more transparent, and regulatory standards more consistent across jurisdictions within the same solar market.

The model has been tailored to Illinois-specific enabling statutes, ordinance practices, and community priorities currently seen in the state, with input from local planning, solar industry, and other experts. Because Illinois communities' ordinances, comprehensive plans and other local planning documents naturally vary, not all provisions included in the Model Ordinance will be suitable for each individual community. Moreover, as this is a "best practices" document, communities may decide not to include one or more suggested provisions. A community may also be aware of elements not included in this Model Ordinance that they wish to include. These sorts of adjustments are to be expected.

The model ordinance language addresses land use concerns for both urban and rural areas, and thus not all the provisions may be appropriate for every community. Large-scale solar (principal solar land uses) are much more likely to be proposed in rural areas rather than developed cities. However, urban areas should consider where community-or large-scale solar can add value to the community and enable economic development of a valuable local resource. Rural communities should similarly address rooftop and accessory ground-mounted development, although the standards used in this model are tailored more for urban circumstances.

Model Ordinance

- I. Scope This article applies to all solar energy installations in Model Community.
- II. Purpose Model Community has adopted this regulation for the following purposes:
 - A. **Comprehensive Plan Goals** To meet the goals of the Comprehensive Plan and preserve the health, safety, and welfare of the community by promoting the safe, effective, and efficient use of solar energy systems. The solar energy standards specifically implement the following goals from the Comprehensive Plan:
 - 1. **Goal** Encourage the use of local renewable energy resources, including appropriate applications for wind, solar, and biomass energy.
 - 2. **Goal** Promote sustainable building design and management practices to serve current and future generations.
 - B. Climate Change Goals Model Community has committed to reducing carbon and other greenhouse gas emissions. Solar energy is an abundant, renewable, and nonpolluting energy resource and its conversion to electricity or heat reduces dependence on nonrenewable energy resources and decreases the air and water pollution that results from using conventional energy sources.
 - C. **Consistency with State Climate Goals** Model Community recognizes that the transition to renewable energy supported by Illinois state policy will result in significant investment in and development of the community's solar energy resources.
 - D. Infrastructure Distributed solar photovoltaic systems will enhance the reliability and power quality of the power grid and make more efficient use of Model Community's electric distribution infrastructure.
 - E. Local Resource Solar energy is an underused local energy resource, and encouraging the use of solar energy will diversify the community's energy supply portfolio and reduce exposure to fiscal risks associated with fossil fuels.
 - F. Provide Financial Benefits to Consumers and Improve Competitive Markets – Solar energy systems offer additional energy choice at lower cost to consumers and property owners and will improve competition in the electricity and natural gas supply market.

Comprehensive Plan Goals

Tying the solar energy ordinance to Comprehensive Plan goals is particularly important for helping users (both Planning Commission and community members) understand why the community is developing and administering regulation.

The language here provides examples of different types of Comprehensive Plan goals, and other policy goals that the community may have that are served by enabling and encouraging solar development. The community should substitute its policy goals for these examples.

The Comprehensive Plan may not include goals that are enhanced by solar development, (such as climate protection or local resource economic goals). The community should consider creating a local energy plan or similar policy document to provide a policy foundation for solar development regulation.

Clean and Equitable Jobs Act (CEJA)

In 2021 the Illinois legislature passed CEJA, one of the nation's most aggressive climate action legislative initiatives. Among its provisions, CEJA sets goals and provides funding to transition the Illinois electric system to 40% renewable energy by 2030. Illinois will see significant and consistent development of the state's wind and solar energy resources as a result.

Climate Protection Strategies

Local governments that are participating in the Cities for Climate Protection program, Mayor's Climate Protection signatories, the Cool Cities/Cool Counties program, or have adopted climate protection or energy independence policies or plans can use private solar investment to meet those goals.

Illinois Model Solar Ordinance | February 2024

III. Definitions

Agrivoltaics – A solar energy system co-located on the same parcel of land as agricultural production, including crop production, grazing, apiaries, or other agricultural products or services.

Building-integrated Solar Energy Systems – A solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Buildingintegrated systems include, but are not limited to, photovoltaic or hot water solar energy systems contained within roofing materials, windows, skylights, and awnings.

Commercial Solar Energy System – Any device or assembly of devices that (i) is ground installed and (ii) uses solar energy from the sun for generating electricity for the primary purpose of wholesale sale and not primarily for consumption on the property on which the device or devices reside as defined in Illinois Statute 55 ILCS 5/5-12020 (a).

Community Solar Energy System – A commercial solar energy system that is eligible for community solar incentives as administered by the Illinois Power Agency credits the value of electricity generated by the facility to the subscribers of the facility and is limited in nameplate capacity to less than or equal to 5,000 kilowatts.

Grid-intertie Solar Energy System – A photovoltaic solar energy system that is connected to an electric circuit served by an electric utility company.

Ground-Mounted – A solar energy system mounted on a rack or pole that rests or is attached to the ground. Ground-mounted systems can be either accessory or principal uses.

Off-grid Solar Energy System – A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility company.

Photovoltaic System – A solar energy system that converts solar energy directly into electricity.

Solar Definitions

Not all these terms are used in this model ordinance, nor is this a complete list of solar definitions. As a community develops its own development standards for solar technology, many of the terms defined here may be helpful in creating transparent and predictable permitting standards. Terms used in regulatory language need to be included in the definitions section.

Differentiating Solar Uses by Size

Community and Commercial solar facilities are defined here based on the Illinois statutory definitions, and make the two land use categories mutually exclusive. Communities (both counties and municipalities) can adopt acreagebased thresholds, that are approximately equivalent to the capacity (KW) threshold. 5,000 KW as a ground-mount principal use would be 40-50 acres. Communities can also adopt size-based standards that are smaller than 40 acres, as an ex-urban city (for instance) might want to limit principal use solar to something less than 40 acres.

County Ordinance Definitions

Illinois Statute 55 ILCS 5-12020 (a) defines terms for use by counties in solar zoning, including: participating and nonparticipating residences/properties, supporting facilities, protected lands, and other definitions necessary for compliance with state statutes.

Pollinator-Friendly Solar – A solar installation that meets the standards of a pollinator-friendly installation set by the Illinois Department of Natural Resources, consistent with Illinois Statute 525 ILCS 55/.

Roof-Mounted – A solar energy system mounted on a rack that is fastened to or ballasted on a structure roof. Roofmounted systems are accessory to the principal use.

Solar Access – Unobstructed access to direct sunlight on a lot or building through the entire year, including access across adjacent parcel air rights, for the purpose of capturing direct sunlight to operate a solar energy system, consistent with Illinois Statute 30 ILCS 725 1.2 (e).

Solar Carport – A solar energy system installed on a carport structure that is accessory to a parking area and may include electric vehicle supply equipment or energy storage facilities for use in electric vehicle charging.

Solar Collector – A device, structure, or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy. The collector does not include frames, supports, or mounting hardware.

Solar Daylighting – Capturing and directing the visible light spectrum for use in illuminating interior building spaces in lieu of artificial lighting, usually by adding a device or design element to the building envelope.

Solar Energy – Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Solar Energy Easement – An easement consistent with ILCS 725 1.2(f) that limits the height or location, or both, of permissible development on the burdened land in terms of a structure or vegetation, or both, for the purpose of providing access to sunlight for the burdened land.

Solar Energy System – A device, array of devices, or structural design feature, with the purpose of providing generation or storage of electricity from sunlight; the collection, storage, and distribution of solar energy for space heating or cooling; daylight for interior lighting; or water heating.

Solar Hot Air System – A solar energy system that includes a solar collector to provide direct supplemental space heating by heating and re-circulating conditioned building air.

Solar Hot Water System – A system that includes a solar collector and a heat exchanger that heats or preheats water for building heating systems or other hot water needs, including residential domestic hot water and hot water for commercial processes.

Solar Mounting Devices – Racking, frames, or other devices that allow the mounting of a solar collector onto a roof surface or the ground.

Solar Ready Design –The design and construction of a building that facilitates and makes the installation of rooftop solar feasible.

Solar Resource – A view of the sun from a specific point on a lot or building that is not obscured by any vegetation, building, or object for a minimum of four hours between the hours of 9:00 a.m. and 3:00 p.m. Standard Time on all days of the year and can be measured in annual watts per square meter.

Solar Resource

Understanding what defines a "solar resource" is foundational to how land use regulation affects solar development. Solar energy resources are not simply where sunlight falls. A solar resource has minimum spatial and temporal characteristics and needs to be considered not only today but also into the future. Solar energy equipment cannot function as designed if installed in partial shade, with too few hours of daily or annual direct sunlight, or without southern or near-southern exposure. Many provisions of the model ordinance are predicated on the concept that a solar resource has definable characteristics that are affected by local land use decisions and regulation.



Solar energy resources for a midwestern city (St. Louis Park, MN). *Photo from Great Plains Institute.*



Close-up view showing just the rooftop resources in St. Louis Park, MN. *Photo from Great Plains Institute.*

- IV. Permitted Accessory Use Solar energy systems other than commercial or community solar energy systems are a permitted accessory use in all zoning districts where structures of any sort are allowed and are subject to certain requirements as set forth below, except for systems serving an agricultural use as provided in Illinois Statutes 55 ILCS 5/5-12001. Solar carports and associated electric vehicle charging equipment are a permitted accessory use on surface parking lots in all districts. Solar energy systems that do not meet the following design standards will require a conditional use permit.
 - A. **Height** Solar energy systems must meet the following height requirements:
 - 1. Building or roof-mounted solar energy systems must not exceed the maximum allowed height in any zoning district. For purposes of height measurement on flat roofs, solar energy systems will be given an equivalent exception to height standards as buildingmounted mechanical devices or equipment elsewhere in this ordinance.
 - 2. Ground or pole-mounted solar energy systems must not exceed 15 feet in height when oriented at maximum tilt.
 - 3. Solar carports in non-residential districts must not exceed 20 feet in height.

Agricultural Accessory Uses

Illinois statutes limit counties in the standards they can apply to structures used for agricultural purposes, which is likely to apply to accessory use solar (55 ILCS 5/5-12001). These standards will generally apply when the principal use is not agricultural.

Height - Rooftop System

This ordinance notes exceptions to the height standard when other exceptions are granted in the ordinance. Communities should directly reference the exception language, rather than use the placeholder language here.

Height - Ground or Pole Mounted System

This ordinance sets a 15-foot height limit, which is typical for residential accessory uses. Some communities allow solar to be higher than other accessory uses in order to enable capture of the lot's solar resource when lots and buildings are closer together. An alternative is to balance height with setback, allowing taller systems if set back farther– for instance, an extra foot of height for every extra two feet of setback. In rural (or large lot) areas, solar resources are unlikely to be constrained by trees or buildings on adjacent lots and the lot is likely to have adequate solar resource for a lower (10-15 foot) ground-mounted application.



Ground-mount accessory use solar, located on a commercial lot across from a residential zone. *Photo from Great Plains Institute*.



Ground-mount accessory use solar, with an agricultural principal use. *Photo from Great Plains Institute.*

- B. **Setback** Solar energy systems must meet the accessory structure setback for the zoning district and principal land use associated with the lot on which the system is located, as allowed below.
 - 1. **Roof or Building-mounted Solar Energy Systems** The collector surface and mounting devices for roofmounted solar energy systems must not extend beyond the exterior perimeter of the building on which the system is mounted or built unless the collector and mounting system has been explicitly engineered to safely extend beyond the edge, and setback standards are not violated. Exterior piping for solar hot water systems is allowed to extend beyond the perimeter of the building on a side yard exposure. Solar collectors mounted on the sides of buildings and serving as awnings are considered to be building-integrated systems and are regulated as awnings.
 - 2. **Ground-mounted Solar Energy Systems** Ground-mounted solar energy systems may not extend into the side or rear setback when oriented at minimum design tilt, except as otherwise allowed in this ordinance for building mechanical systems.



Roof-mount residential accessory solar use, flush-mounted on a pitched roof, below the roof peak. *Photo from Great Plains Institute.*



Ground-mount accessory use, agricultural co-op within a city. *Photo from Great Plains Institute.*

- C. Visibility and Design Standards Solar energy systems in residential districts must be designed to be consistent with Model Community's design and character goals as viewed from the public right-of-way, as described in C.1-3, to the extent that doing so does not affect the cost or efficacy of the system.
 - 1. **Building Integrated Photovoltaic Systems** Building integrated photovoltaic solar energy systems are allowed regardless of whether the system is visible from the public right-of-way, provided the building component in which the system is integrated meets all required setback, land use, or performance standards for the district in which the building is located.

Visibility and Aesthetics

Aesthetic regulation should be tied to design principles rather than targeted at a specific land use. If the community already regulates aesthetics in residential districts, this model language provides guidance for balancing between interests of property owners who want to use their on-site solar resources and neighbors concerned with neighborhood character. Substantial evidence demonstrates that solar installations have no effect on property values of adjacent properties. But where aesthetic regulation is used to protect community character, these standards provide balance between competing goals.

Building Integrated PV

Building integrated solar energy systems can include solar energy systems built into roofing (existing technology includes both solar shingles and solar roofing tiles), into awnings, skylights, and walls.

- Aesthetic restrictions If the system is not visible from the closest edge of any public right-of-way other than an alley or if the system meets the following standards, the system is in compliance with visibility and design provisions of this ordinance.
 - a. Roof-mounted systems on pitched roofs visible from the nearest edge of the front right-of-way must have the same finished pitch as the roof and be no more than ten inches above the roof.
 - b. Roof-mounted systems on flat roofs visible from the nearest edge of the front right-of-way must not be more than five feet above the finished roof and are exempt from any rooftop equipment or mechanical system screening requirements.

Roof-Mounted Solar Energy Systems

This ordinance sets a threshold for pitched roof installations that they not be steeper than the finished roof pitch. Mounted systems steeper than the finished roof pitch change the appearance of the roof, and create additional considerations in regard to the wind and drift load on structural roof components. If the aesthetic impacts are not a concern to the community, the structural issues can be addressed in the building permit.



- 1. Ground-mounted systems are exempt from lot coverage or impervious surface standards if the soil under the collector is maintained in vegetation and not compacted.
- 2. Ground-mounted systems do not count toward accessory structure limitations.
- 3. Solar carports in non-residential districts are exempt from lot coverage limitations but must meet all parking standards in this ordinance.

Impervious Surface Coverage

mounted, below the roof peak. Photo from Great Plains Institute.

Rather than consider the solar panel for a ground-mounted system as a roof, this provision recognizes that the ground under the panel can mitigate stormwater risks if it is kept in vegetation so that rain water can infiltrate. Any effects are de minimus for a small array if the lot is otherwise within coverage ratios.

Roof Coverage

Roof coverage limitations are generally not necessary, as some of the roof is likely to be shaded or otherwise not suitable for solar energy. Coverage limits in the building or fire code are addressed in the code permit and do not need to be included in the zoning standards.



Roof-mounted commercial accessory use on an office building,

arrays are lower than mechanical equipment. Photo from Great

Plains Institute.



- E. **Historic Buildings** Solar energy systems on buildings within designated historic districts or on locally designated historic buildings (exclusive of state or federal historic designation) must be approved by the community Heritage Preservation Commission, consistent with the standards for solar energy systems on historically designated buildings published by the US Department of Interior.
- F. **Plan Approval Required** All solar energy systems requiring a building permit or other permit from Model Community must provide a site plan for review.
 - Plan Applications Plan applications for solar energy systems must be accompanied by to-scale horizontal and vertical (elevation) drawings. The drawings must show the system's location on the building or on the property for a ground-mounted system, including the property lines.
 - Plan Approvals Applications that meet the design requirements of this ordinance will be granted administrative approval by the zoning official and do not require Planning Commission review. Plan approval does not indicate compliance with the Building Code or Electric Code.
- G. **Approved Solar Components** Electric solar energy systems components must have a UL or equivalent listing, and solar hot water systems must have an SRCC rating.
- H. **Compliance with Building Code** All solar energy systems must meet local building code standards.
- I. **Compliance with State Electric Code** All photovoltaic systems must comply with the Illinois State Electric Code.
- J. **Compliance with State Plumbing Code** Solar thermal systems must comply with applicable Illinois State Plumbing Code requirements.
- K. Utility Notification All grid-intertie solar energy systems must comply with the interconnection requirements of the electric utility. Off-grid systems are exempt from this requirement.
- L. Restrictions on Solar Energy Systems Limited Consistent with Illinois Statute 765 ILCS 165, no homeowners' agreement, covenant, common interest community, or other contract between multiple property owners within a subdivision of Model Community can prohibit or restrict homeowners from installing solar energy systems. No energy policy statement enacted by a common interest community can be more restrictive than Model Community's solar energy standards.

Plan Approval

This process is generally part of the process for obtaining a building permit. If the community does not issue building permits, it can be tied to a land use permit instead. For rural areas or cities without standards for rooftop systems, the plan approval section may be eliminated.

Homeowner Installation Rights Protected

No deed restrictions, covenants, or similar binding agreements running with the land shall prohibit or have the effect of prohibiting a solar energy system from being installed on a building erected on a lot or parcel covered by the deed restrictions [...]

Source: Illinois Statute 765 ILCS 165/20

Glare (Accessory Uses)

This ordinance does not include glare standards for accessory use solar installations. Solar collectors (the panels) have glass surfaces and thus will reflect light. However, the glare risk associated with accessory use solar is generally lower and less intrusive to nearby land uses than glare from glass windows, which are ubiquitous in developed areas. The surface area of a residential solar array may actually be less than the window surface area of a typical single-family home. The horizontal orientation of a window is much more likely to reflect sunlight into the neighbor's home or onto a nearby street than is a solar array (which is tilted toward the sky). In most cases, a solar panel reflects less than a window.

For the most part, concerns about glare from residential systems are misplaced: local governments do not regulate reflected light from window glass or other glass building components. That is not to say that there is not occasionally glare from a solar panel - if the angle of the sun and the panel and the viewer are positioned just right. But, like windows, the reflection is intermittent and of short duration. V. Principal Uses – Model Community encourages the development of commercial and community-scale solar energy systems where such systems present few land use conflicts with current and planned future land uses or utilize difficult-to-develop areas such as former mine lands, brownfields, or areas poorly suited for agriculture. Commercial solar energy systems are conditional uses in all districts where agricultural or industrial uses are permitted.

A. Principal Use General Standards

- 1. Site Design
 - a. **Setbacks** Commercial and community solar facilities must meet the following setbacks:
 - 1. Property line setback of 50 feet from non-participating properties, except as otherwise determined in 1.a.4 below.
 - 2. Roadway setback of 50 feet from the nearest right-of-way (ROW) edge for all road categories.
 - 3. Occupied community buildings or dwellings setback of 150 feet for non-participating properties, except as otherwise determined in 1.a.5 below.
 - Protected lands property line setback of 500 feet or the site-specific guidelines of the Illinois Department of Natural Resources (IDNR) as part of an Ecological Compliance Assessment Tool (EcoCAT) natural resource review report under 17 Ill. Admin. Code Part 1075.
 - 5. Setback distance is measured from the edge of any component of the solar facility to the nearest edge of the setback object (building, ROW, property line).

Community and Commercial Solar

Illinois statutes define community solar as a distinct type of commercial solar facilities that may require distinct siting and standards for jurisdictions other than counties. Municipalities are unlikely to see commercial solar facilities within jurisdictional boundaries, other than community-scale developments.

Community solar facilities can offer distinct benefits to the community distinct from other commercial solar. A separate section for community solar is included below for use by non-county jurisdictions..

The size of community solar facilities (anywhere from a few acres to 40 acres) allows the facilities to be strategically sited to to ensure the host community captures co-benefits and minimizes land use conflicts. Co-benefits can include improved utilization of marginal farmland or fragmented parcels, integration of local food production, improved water quality in impaired watersheds, restoration of habitat, or buffering protected lands from encroaching development.

Appropriate Setbacks

Illinois has mandated statewide setback standards for commercial solar and wind energy projects located outside incorporated areas. The model ordinance language here incorporates those standards. Counties do not have flexibility in either ordinance or permitting processes to require larger setbacks, except as identified by IDNR regarding setbacks from specific protected natural resource areas.

Solar farm certified as habitat-friendly with established native ground cover. *Photo from Great Plains Institute.*

Conventional solar farm with chain link fence, turf grass ground cover *Photo from Great Plains Institute.*



- b. **Screening** Commercial solar must be screened from existing residential dwellings.
 - 1. A screening plan that identifies the type and extent of screening must be submitted. The screening must be included in the project's vegetative management plan and must include provisions to maintain the screening for the life of the facility.
 - 2. Screening must be consistent with Model Community's screening ordinance or standards typically applied for other land uses requiring screening.
 - 3. Screening must not be required along property lines within the same zoning district except where the adjoining lot has an existing residential use.
 - 4. Model Community will require screening where it determines there is a clear community interest in maintaining a viewshed.

Screening

Illinois Statute 55 ILCS 5-12020 allows counties to require screening of commercial solar facilities, although the screening method cannot include earthen berms or similar structures. Vegetative screening can add to habitat or agricultural co-benefit value if coordinated with the ground cover requirements and vegetative management plan.

For any type of solar facility (community or commercial), the community should consider limiting screening requirements to where there is a visual impact from an existing use, such as adjacent residential districts or uses. Solar energy systems do not need to be screened from adjacent lots in agricultural use, are nonresidential, or have low-intensity commercial uses.



- c. **Ground cover and buffer areas** The following provisions apply to the clearing of existing vegetation and establishment of vegetated ground cover. Additional site-specific conditions may apply as required by Model Community.
 - 1. Large-scale removal of mature trees on the site is discouraged. Model Community may set additional restrictions on tree clearing or require mitigation for cleared trees.
 - 2. The project design must include the installation and establishment of ground cover meeting the pollinatorfriendly standard consistent with 525 ILCS 55/1 "Pollinator-Friendly Solar Site Act" or successor statutes and guidance as set by the Illinois Department of Natural Resources.
 - 3. The applicant must submit a vegetation management plan adhering to guidance set forth by the Illinois Department of Natural Resources and consistent with weed and vegetation control outlined in the Agricultural Impact Mitigation Agreement.

Ground Cover and Vegetation Management

Illinois statutes (55 ILCS 5-12020) specifically enable counties to require commercial solar projects to meet the Illinois pollinator-friendly standard (see text box below) and submit a vegetation management plan consistent with standards developed by the IDNR.

"To maximize community benefits, including, but not limited to, reduced stormwater runoff, flooding, and erosion at the ground mounted solar energy system, improved soil health, and increased foraging habitat for game birds, songbirds, and pollinators, a county may (1) require a commercial solar energy facility owner to plant, establish, and maintain for the life of the facility vegetative ground cover, consistent with the goals of the Pollinator-Friendly Solar Site Act and (2) require the submittal of a vegetation management plan in the application to construct and operate a commercial solar energy facility in the county."

Evergreen trees planted to grow into a visual screen along a publicCerright of way. Photo from Great Plains Institute.grow



- 4. Pollinator-friendly standards must be maintained on the site for the duration of site operation until the site is decommissioned.
- 5. Model Community may require submittal of an inspection fee with the initial permit application to support ongoing inspection of the pollinator-friendly ground cover and consistency with the vegetation management plan.
- 6. The applicant must submit a financial guarantee in the form of a letter of credit, cash deposit, or bond in favor of the Community equal to one hundred twenty- five (125) percent of the costs to meet the pollinator-friendly standard. The financial guarantee must remain in effect until vegetation is fully established, as verified by the county conservation official.
- d. **Foundations** A qualified engineer must certify that the foundation and design of the solar panel racking and support are within accepted professional standards, given local soil and climate conditions.
- e. **Power and communication lines** Power and communication lines running between banks of solar panels and to nearby electric substations or interconnections with buildings must be buried underground. Model Community may grant exemptions in instances where shallow bedrock, water courses, or other elements of the natural landscape interfere with the ability to bury lines, or distance makes undergrounding infeasible,

Pollinator-Friendly Solar Site Act

Illinois statutes created, and the Department of Natural Resources manages, a voluntary certification program and scorecard for "pollinator-friendly" solar development. This ordinance requires that solar developers participate in the program, in order to capture local co-benefits of pollinator ground cover and habitat (including visual impacts, pollinator ecosystem services for crops, and water quality benefits from enhanced infiltration and reduced sedimentation and nitrate risk to groundwater).

Drinking Water Protection

In identifying preferred areas or districts for solar principal uses, the community should consider co-benefits of solar energy development. One such potential co-benefit is protection of drinking water supplies. Solar energy development may be intentionally sited within vulnerable portions of public water supply systems as a best management practice to restore and protect perennial groundcover that reduces nitrate contamination of ground water supplies.

or protection of soils and decommissioning consistent with the AIMA is necessary at the discretion of the zoning administrator.

f. **Fencing** – Perimeter fencing for the site must not include barbed wire and must adhere to wildlife-friendly fencing standards that include clearance at the bottom. Alternatives to wildlife-friendly fencing can be used if the site incorporates agrivoltaics or to meet existing fencing standards for the district in which the facility is located.

Habitat-friendly fencing at a solar farm. *Photo from Great Plains Institute.*

Solar farm electric invertors with habitat-friendly fencing and ground cover. *Photo from Great Plains Institute.*



- 2. Stormwater and NPDES Commercial solar energy systems are subject to Model Community's stormwater management, erosion and sediment control provisions, and National Pollutant Discharge Elimination System (NPDES) permit requirements. Solar collectors will not be considered impervious surfaces if the project complies with ground cover standards as described in A.1.c of this ordinance.
- 3. Other standards and codes All commercial solar must be in compliance with all applicable local, state, and federal regulatory codes, including the State of Illinois Uniform Building Code, as amended, and the National Electric Code, as amended.
- 4. Site Plan Required The applicant must submit a detailed site plan for both existing and proposed conditions, showing locations of all solar arrays, other structures, property lines, rights-ofway, service roads, floodplains, wetlands, and other protected natural resources, topography, electric equipment, and all other characteristics requested by Model Community. The site plan should show all zoning districts and overlay districts.
- 5. Aviation Protection For commercial solar located within 500 feet of an airport or within approach zones of an airport, the applicant must complete and provide the results of a glare analysis through a gualitative analysis of potential impact, field test demonstration, or geometric analysis of ocular impact in consultation with the Federal Aviation Administration (FAA) Office of Airports, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or most recent version adopted by the FAA.

Stormwater and Water Quality Standards

Stormwater and water quality risks are defined by several site and site design characteristics that can be addressed in the solar ordinance to meet the postconstruction requirements of the Illinois construction stormwater permit.

Site characteristics that affect runoff and water quality include soil type and soil depth, which should be identified by the applicant in the permit application submittal in order for the community to encourage appropriate risk mitigation and capture water quality benefits. Site design characteristics that mitigate risk and create local water quality benefits include managing soil bulk density (compaction), ground cover choices, and array spacing and direction. Using low-impact development standards during construction, meeting post-construction bulk density standard can significantly reduce or replace the need for structured stormwater management. Deeprooted perennial grasses and flowing plants under the panels, between arrays, and in setback or buffer areas improve infiltration and create habitat co-benefits, particularly when compared to conventional agriculture.

See the PV-SMaRT best practices guide and runoff calculator tool to verify site-specific opportunities and for more direct guidance about low-impact development standards and site design recommendations.

Site Plan

concern.

Commercial solar developers should provide a site plan similar to that required by the community for any other development. Refer to your existing ordinance to guide site plan submittal requirements.

Aviation Standards, Glare

This standard was developed for the FAA

for solar installations on airport grounds. It

can also be used for commercial solar and

garden development in areas adjacent to

airports. This standard is not appropriate

for areas where reflected light is not a safety

Poor initial stormwater management and subsequent corrective groundcover. Photos from Minnesota Department of Commerce.





- 6. Agricultural Protection Commercial solar permit applicants must submit site assessment or soil identification standards for agricultural soils as required in this ordinance. Applicants must also submit an Agricultural Impact Mitigation Plan to Model Community and the Illinois Department of Agriculture, as required in Illinois Statutes (505ILCS 147, or successor statute), and maintain AIMP standards for the life of the project through decommissioning. Model Community encourages mitigation for use of prime soils for solar array placement, including the following:
 - a. For compliant commercial solar facilities located primarily on prime soils, Model Community may issue interim use or timelimited CUP that allows the site to be returned to agriculture at the end of life and post decommissioning of the solar installation, consistent with the approved AIM plan.
 - b. Model Community encourages commercial solar facilities that include co-location of agricultural uses (agrivoltaics) on the project site.
 - c. Model Community encourages working with landowners to place agricultural conservation easements on parcels with prime soils to protect priority natural resources that support the community's agricultural base.
 - d. Model Community encourages commercial solar facilities on designated wellhead protection areas for the purpose of removing agricultural uses from high-risk recharge areas.

Agricultural Impact Mitigation Plan

State law requires all solar installations greater than 500 KW to prepare an Agricultural Impact Mitigation Plan, which must be included in the local conditional use permit or other permit.

Protection of Agricultural Practices

Illinois state statutes require counties to permit compliant commercial solar facilities wherever agriculture is a permitted use.

If the community has ordinances that require development proposals to identify protect, or require high priority agricultural soils, this provision applies those same standards to solar development, and encourages use of solar-specific mitigation opportunities.

Commercial solar do not pose the same level or type of risk to agricultural practices as does housing or commercial development. Commercial solar can be considered an interim use that can be turned back to agriculture at the end of the commercial solar's life (usually 25 years), and solar land uses will discourage, rather than enable, ancillary or secondary development in the rural areas where solar is deployed.

Sheep grazing on solar farm. *Photo from Minnesota Native Landscapes.*

- 7. **Decommissioning** A decommissioning plan must be prepared and submitted as part of the Agricultural Impact Mitigation Plan (Illinois Statute 505 ILCS 147).
 - a. Decommissioning of the system must occur if the project is not in use for 12 consecutive months.
 - b. The plan must include provisions for the removal of all structures and foundations, restoration of soil and vegetation, and consistency with all standards of the AIMP.

Decommissioning Standards

Counties must use the decommissioning standards identified in Illinois Statute 55 ILCS 5-12020, which limit standards to those defined in the agricultural impact mitigation agreement. Counties can require decommissioning financial assurances, but only as defined in the AIMA: "The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by those agricultural impact mitigation agreements, minus the salvage value of the project."



Vegetable farming within a solar installation. *Photo by Dennis* Schroeder, National Renewable Energy Lab.

16

Illinois Model Solar Ordinance | February 2024

Non-county jurisdictions have unrestricted (not subject to statutory siting standards) land use authority over commercial solar, unlike counties. However, many of the provisions and requirements that f. Community solar projects must file an Agricultural Impact provide community benefits (noted in the Mitigation plan with decommissioning standards consistent commercial solar section above) should also be considered by non-county jurisdictions. with Illinois Statute 505 ILCS 147/15. Non-county jurisdictions can develop separate standards for large-scale solar

Ground-mounted Community Solar

Ground-mounted community solar projects are principal, rather than accessory, uses.

if there is large rural or agricultural areas within jurisdictional boundaries that the community does not see as urban expansion

within the next 25 years.

jurisdictions. Land use impacts of community solar are generally going to be less than other land uses (such as housing), and should not be held to a more restrictive standard, except for areas slated for urban service expansion and development. Making community solar a conditional use can allow case-by-case consideration of the opportunity costs associated with urban expansion.

Use Standards

This language is for use standards and districts applicable to non-county

Project Size

community solar projects as having a maximum capacity of 5 megawatts, which is approximately equivalent to 40 acres of development. Some site conditions, such as unbuildable areas on the site, may require the project to be larger than 40 acres in order to reach the maximum size allowed under law.

Illinois Statute 20 ILCS 3855/1-10) define

Impact Mitigation Agreement. B. Community-Scale Solar - Model Community permits the development of community-scale solar, subject to the following

d. Financial assurances for decommissioning the site must be

c. Disposal of structures and/or foundations must meet the

provisions of the Model Community Solid Waste Ordinance.

provided to Model Community consistent with the Agricultural

- standards and requirements: 1. Rooftop community systems are permitted in all districts where
 - buildings are permitted, subject to the solar accessory use standards in this ordinance.
- 2. Principal use community solar projects standards.
 - a. Ground-mounted community solar projects are limited to 40 acres or a rated capacity of 5 MW, whichever is greater.
 - b. Ground-mounted community solar projects are a permitted use in agricultural districts, and conditional in all other nonresidential districts.
 - c. Dimensional standards All structures must comply with setback and height standards for the district in which the system is located.
 - d. The project must install and establish ground cover meeting the pollinator-friendly standard consistent with 525 ILCS 55/1 "Pollinator-Friendly Solar Site Act" or successor statutes and guidance as set by the Illinois Department of Natural Resources (IDNR). The applicant must submit a vegetation management plan adhering to guidance set forth by the IDNR. Pollinator-friendly standards must be maintained on the site for the duration of site operation until the site is decommissioned.
 - e. Model Community may require an inspection fee with the initial permit application to support ongoing inspection of the pollinator-friendly ground cover and consistency of site management with the filed vegetation management plan.

Rooftop Community Solar

Rooftop community solar and rooftop accessory use solar installations are indistinguishable from each other as a land use and should be treated the same under the ordinance.

- C. Large-Scale Solar Ground-mounted solar energy arrays that are the principal use on the lot, designed for providing energy to off-site uses or export to the wholesale market, are permitted under the following standards:
 - 1. **Conditional use permit** Commercial solar are conditional uses in agricultural districts, industrial districts, shoreland and floodplain overlay districts, airport safety zones subject to A.1.5. of this ordinance, and in the landfill/brownfield overlay district for sites that have completed remediation.

VI. Solar Energy Zoning Incentives

Example Use Table

Large-Scale Solar Conditional Uses

Large -scale solar should require a conditional use or interim use permit in order for the community to consider the site-specific conditions. The districts listed here are examples. Each community needs to consider where large scale solar is suitable in the context of its zoning districts and priorities.

Use Type	Residential	Mixed Use	Commercial	Industrial	Agricultural	Floodplain	Brownfield/ Mine land reclamation overlay	Special (conservation, historic)
Commercial solar				С	С	С	С	С
Community solar ground-mount				С	С	С	Р	С
Community solar rooftop	PS	Р	Р	Р	Р	PS	PS	PS
Accessory use ground-mount solar	PS	Ρ	Р	Ρ	Ρ	С	Ρ	С
Rooftop solar	Р	Р	Р	Р	Р	PS	PS	PS

P = Permitted

PS = Permitted Special (additional separate permit or review)

C = Conditional

Blank Cell = Prohibited

Solar as a Land Use

The above use table shows five types of solar land uses (three accessory uses, two principal uses) and an example group of districts or overlays. Not all communities will use all five solar land uses and each community's districts/overlays will vary considerably from this example. The logic for each of the table's entries is described below for illustration purposes.

- Rooftop systems are permitted in all districts where buildings are permitted, with recognition that some districts, such as historic districts, will have special standards or permits in addition to zoning permits.
- Accessory use ground-mounted systems are conditional where potentially in conflict with the principal district or overlay goal.
- Community-scale solar principal uses are conditional where land use conflicts or opportunity conflicts are high, permitted where a 40-acre development can be integrated into the landscape, and requiring special consideration in floodplain overlay districts.
- Commercial solar is prohibited in higher density or urban service districts, and conditional in other districts. State law mandates that counties allow commercial solar (including community solar) wherever agricultural or industrial uses are allowed. Both community and commercial solar is conditional in floodplain districts or overlays because the site design standards requiring pollinator-friendly ground cover not only ensure a low-impact development but can result in a restoration of ecosystem services from the previous (usually agricultural) use. Similarly, use standards encourage solar development on brownfield and mine land reclamation areas.

A. Condition for Planned Unit Development (PUD) Approval – Model Community may require on-site renewable energy systems, zeronet-energy (ZNE) or zero-net-carbon (ZNC) building designs, solarsynchronized electric vehicle charging, or other clean energy systems as a condition for approval of a PUD permit if needed to mitigate for:

- 1. Impacts on the performance of the electric distribution system,
- 2. Increased local emissions of greenhouse gases associated with the proposal,
- 3. Need for electric vehicle charging infrastructure to offset transportation-related emissions for trips generated by the new development,
- 4. Other impacts of the proposed development inconsistent with the Model Community Comprehensive Plan.
- B. Solar Roof Incentives Model Community encourages incorporating an on-site renewable energy system or meeting ZNE construction standards for new construction and redevelopment. Model Community may require on-site renewable energy or ZNE construction when issuing a conditional use permit where the project has not demonstrated consistency with Model Community's Climate Action Plan.
 - 1. **Density Bonus** Any application for subdivision of land in the _____ Districts that will allow the development of at least four new lots of record must be allowed to increase the maximum number of lots by 10 percent or one lot, whichever is greater, provided all building and wastewater setbacks can be met with the increased density, if the applicant enters into a development agreement guaranteeing at least three (3) kilowatts of PV for each new residence that has a solar resource.
 - 2. **Solar-Ready Buildings** Model Community encourages builders to use solar-ready design in buildings. Buildings that submit a completed US EPA Renewable Energy Ready Home Solar Photovoltaic Checklist (or other approved solar-ready standard) and associated documentation will be certified as a Model Community solar-ready home and are eligible for low-cost financing through Model Community's Economic Development Authority, a designation that will be included in the permit home's permit history.

Solar Roof Incentives

This section of the model ordinance includes a series of incentives that can be incorporated into development regulation. Most cities and many counties use incentives to encourage public amenities or preferred design. These same tools and incentives can be used to encourage private investment in solar energy. Communities should use incentives that are already offered, and simply extend that incentive to appropriate solar development.

Some of the incentives noted here are not zoning incentives, but fit more readily into incentive programs offered by the community (such as financing or incentivebased design standards).

Solar Ready Buildings

New buildings can be built "solar-ready" at very low cost (in some cases the marginal cost is zero). Solar energy installation costs continue to decline in both real and absolute terms, and are already competitive with retail electric costs in many areas. If new buildings have a rooftop solar resource, it is likely that someone will want to put a solar energy system on the building in the future. A solar ready building greatly reduces the installation cost, both in terms of reducing labor costs of retrofits and by "preapproving" most of the installation relative to building codes.

A community's housing and building stock is a form of infrastructure that, although built by the private sector, remains in the community when the homeowner or business leaves the community. Encouraging solar-ready construction ensures that current and future owners can take economic advantage of their solar resource when doing so makes the most sense for them.

Solar Access Subdivision Design

Some communities will require solar orientation in the subdivision ordinance, such as requiring an east-west street orientation within 20 degrees in order to maximize lot exposure to solar resources. However, many such requirements are difficult to meet due to site constraints or inconsistency with other requirements (such as connectivity with surrounding street networks). Rather than simply grant a variance, the community can add a condition that lots with good solar access actually be developed as solar homes.