Illinois Solar Model Ordinance

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Model Solar Ordinance – Illinois

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 system components have become more efficient and less costly, an increasing number of solar energy systems have been installed in Illinois. Market opportunities for solar development have dramatically increased in Illinois over the last five years, such that communities must now address solar installations as land use and development issues. Solar energy components continue to improve in efficiency and decline in price; large-scale solar energy is expected to become the least expensive form of electric energy generation within a few years, surpassing wind energy and natural gas in levelized cost of energy.

Model Solar Energy Standards

This ordinance is based on the model solar energy ordinance originally created for the Department of Energy's Phase I Rooftop Solar Challenge program in Minnesota, and updated for the three-state Grow Solar initiative, funded by Rooftop Solar Challenge Phase 2. This version was last updated June 2020.

But solar energy is much more than just low-cost energy generation. Households and businesses seeking to reduce their carbon footprint see solar energy as a strong complement to energy efficiency. Agricultural producers see solar energy as an economic hedge against price volatility in commodity crops. Utilities see solar's declining cost, high reliability, and free fuel 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 innovative solar site designs are capturing habitat and water quality co-benefits by using solar with habitat-friendly ground cover to restore eco-system functions.

Solar Energy Issues

Local governments in Illinois are seeing increasing interest by property owners in solar energy installations, and are having to address a variety of solar land uses in their development regulation. Given the continuing cost reductions and growing value of clean energy, solar development will increasingly be a local development opportunity, from the rooftop to the large scale solar farm. Three primary issues tie solar energy to development regulations:

1. *Land use conflicts and 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 resource. Communities should consider how to protect and develop 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 economic development, climate protection, and natural resources co-benefits. Local governments have a variety of tools to encourage appropriately sited and designed solar development to meet local goals.

Components of a Solar Standards Ordinance

Solar energy standards should:

1. *Create an as-of-right solar installation path for property-owners*. Create a clear regulatory path (an as-of-right installation) to solar development for accessory uses and — if appropriate — for principal uses such as large-scale solar and ground-mounted community shared solar installations.

2. *Enable principal solar uses.* Define where community- and large-solar energy land uses are appropriate as a principal or primary use, set development standards and procedures to guide development, and capture co-benefit opportunities for water quality, habitat, and agriculture.

3. *Limit regulatory barriers to developing solar resources.* Ensure that access to solar resources is not unduly limited by height, setback, or coverage standards, recognizing the distinct design and function of solar technologies and land uses for both accessory and principal uses.

4. *Define appropriate aesthetic standards.* Retain an as-of-right installation pathway for accessory uses while balancing design concerns in urban neighborhoods and historic districts. Set reasonable aesthetic standards for solar principal uses that are consistent with other principal uses that have visual impacts.

5. *Address cross-property solar access issues.* Consider options for protecting access across property lines in the subdivision process and in zoning districts that allow taller buildings on smaller (urban density) lots.

6. *Promote "solar-ready" design.* Every building that has a solar resource should be built to seamlessly use it. Encourage builders to use solar-ready subdivision and building design.

7. *Include solar in regulatory incentives.* Encourage desired solar development by including it in regulatory incentives: density bonuses, parking standards, flexible zoning standards, financing/grant programs, promotional efforts.

Different Community Types and Settings

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. Issues of solar access and nuisances associated with small or accessory use solar energy systems are of less consequence in rural areas, where lot sizes are almost always greater than one acre. Large-scale and community-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 address rooftop and accessory ground-mounted development, although the standards used in this model are designed more for the urban circumstances.

Solar development is not one thing

Communities would not apply the same development and land use standards to an industrial facility and a single family home, merely because both are buildings. Community and large-scale solar development is a completely different land use than rooftop or backyard solar. Standards that are appropriate for large-scale solar may well be wholly inappropriate for rooftop solar and may unnecessarily restrict or stymie solar development opportunities of homes and business owners.

This ordinance includes language addressing solar energy as an accessory use to the primary residential or commercial use in an urban area, and language for principal solar uses more typically seen in rural communities. Communities should address both types of solar development.

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.
3. Goal – Assist local businesses to lower financial and regulatory risks and improve their economic, community, and environmental sustainability.
4. Goal – Efficiently invest in and manage public infrastructure systems to support development and growth.

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.

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 the use of conventional energy sources.

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.

C. Consistency with Regional Plans – Model Community is part of a regional planning process that has developed recommendations for greenhouse gas reductions, a purpose served by encouraging local solar development.

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. Improve Competitive Markets – Solar energy systems offer additional energy choice to consumers and will improve competition in the electricity and natural gas supply market.

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. Building-integrated systems include, but are not limited to, photovoltaic or hot water solar energy systems that are contained within roofing materials, windows, skylights, and awnings.

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 concepts defined here may be helpful in meeting local goals. For instance, solar daylighting devices may change the exterior appearance of the building, and the community may choose to distinguish between these devices and other architectural changes.

Community-Scale Solar Energy System – A commercial solar energy system that converts sunlight into electricity for the primary purpose of serving electric demands off-site from the facility, either retail or wholesale. Community-scale systems are principal uses and projects typically cover less than 20 acres.

Community Solar Garden – A solar energy system that provides retail electric power (or a financial proxy for retail power) to multiple community members or businesses residing or located off-site from the location of the solar energy system. Also referred to as shared solar.

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.

Differentiating Solar Uses by Size

Community-scale and Large-scale systems are defined here as occupying less than 20 acres and greater than 20 acres respectively. Some communities will use a lower number (ten acres) and some a higher number (up to 50 acres). An ex-urban city would use a lower number and a rural county could use a higher number. Community-scale is generally a size that can fit into the land use fabric of the community without assembly of separate parcels. Some communities have chosen not to distinguish between community- and large-scale, but use a single large-scale designation.

Large-Scale Solar Energy System – A commercial solar energy system that converts sunlight into electricity for the primary purpose of wholesale sales of generated electricity. A large-scale solar energy system will have a project size greater than 20 acres and is the principal land use for the parcel(s) on which it is located.

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.

Passive Solar Energy System – A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

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

Pollinator-Friendly Solar– A solar installation that has been recognized as a pollinator-friendly installation by the Illinois Department of Natural Resources, consistent with Illinois Statutes 525 ILCS 55.

Renewable Energy Easement, Solar Energy Easement – An easement 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 for the benefited land to wind or sunlight passing over the burdened land.

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

Roof Pitch – The final exterior slope of a roof calculated by the rise over the run, typically but not exclusively expressed in twelfths such as 3/12, 9/12, 12/12.

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.

Solar Carport – A solar energy system of any size that is installed on a carport structure that is accessory to a parking area, and which may include electric vehicle supply equipment or energy storage facilities.

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 System– A device, array of devices, or structural design feature, the purpose of which is to provide for generation or storage of electricity from sunlight, or the collection, storage and distribution of solar energy for space heating or cooling, daylight for interior lighting, or water heating.

Solar Hot Air System– (also referred to as Solar Air Heat or Solar Furnace) A solar energy system that includes a solar collector to provide direct supplemental space heating by heating and re-circulating conditioned building air. The most efficient performance includes a solar collector to preheat air or supplement building space heating, typically using a vertically mounted collector on a south-facing wall.

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 constrution of a building that facilitates and makes feasible the installation of rooftop solar.

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 AM and 3:00 PM 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.

IV. Permitted Accessory Use. Solar energy systems are a permitted accessory use in all zoning districts where structures of any sort are allowed, subject to certain requirements as set forth below. Solar carports and associated electric vehicle charging equipment are a permitted accessory use on surface parking lots in all districts regardless of the existence of another building. 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 shall not exceed the maximum allowed height in any zoning district. For purposes of height measurement, solar energy systems other than building-integrated systems shall be given an equivalent exception to height standards as building-mounted mechanical devices or equipment.

2. Ground or pole-mounted solar energy systems shall not exceed 15 feet in height when oriented at maximum tilt.

3. Solar carports in non-residential districts shall not exceed 20 feet in height.

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 roof-mounted solar energy systems shall 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 shall be 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-yard or rear setback when oriented at minimum design tilt, except as otherwise allowed for building mechanical systems.

C. Visibility — Solar energy systems in residential districts shall be designed to minimize visual impacts 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. Visibility standards do not apply to systems in non-residential districts, except for historic building or district review as described in E. below.

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.

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.

1. **Building Integrated Photovoltaic Systems**– Building integrated photovoltaic solar energy systems shall be 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.

2. **Aesthetic restrictions** – Roof-or ground-mounted solar energy systems shall not be restricted for aesthetic reasons 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.

   a. Roof-mounted systems on pitched roofs that are visible from the nearest edge of the front right-of-way shall 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 that are visible from the nearest edge of the front right-of-way shall not be more than five feet above the finished roof and are exempt from any rooftop equipment or mechanical system screening

3. **Reflectors** — All solar energy systems using a reflector to enhance solar production shall minimize glare from the reflector affecting adjacent or nearby properties.

D. **Lot Coverage** — Ground-mounted systems total collector area shall not exceed half the building footprint of the principal structure.

   1. Ground-mounted systems shall be 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 shall not count toward accessory structure limitations.

   3. Solar carports in non-residential districts are exempt from lot coverage limitations.

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 receive approval of the community Heritage Preservation Commission, consistent with the standards for solar energy systems on historically designated buildings published by the U.S. Department of Interior.

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.

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, as described in this Toolkit.

Reflectors

Unlike a solar collector, reflector systems do create a potential glare nuisance. While reflector systems are unusual, communities may want to include this reference as a precaution.

Impervious Surface Coverage

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 is an issue of concern in order to ensure ready roof access in the event of a fire. Coverage limits can be a percentage limitation, such as 80% of the total south-facing roof, or a required setback from one or more edges.

F. Plan Approval Required — All solar energy systems requiring a building permit or other permit from Model Community shall provide a site plan for review.

1. Plan Applications. Plan applications for solar energy systems shall be accompanied by to-scale horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building or on the property for a ground-mounted system, including the property lines.

2. Plan Approvals. Applications that meet the design requirements of this ordinance shall be granted administrative approval by the zoning official and shall not require Planning Commission review. Plan approval does not indicate compliance with Building Code or Electric Code.

G. Approved Solar Components — Electric solar energy system 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 shall meet approval of local building code officials, consistent with the State of Illinois Building Code, and solar thermal systems shall comply with HVAC-related requirements of the Energy Code.

I. Compliance with State Electric Code — All photovoltaic systems shall comply with the Illinois State Electric Code.

J. Compliance with State Plumbing Code — Solar thermal systems shall comply with applicable Illinois State Plumbing Code requirements.

K. Utility Notification — All grid-intertie solar energy systems shall comply with the interconnection requirements of the electric utility. Off-grid systems are exempt from this requirement.

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.

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 or utility scale solar energy systems where such systems present few land use conflicts with current and future development patterns. Ground-mounted solar energy systems that are the principal use on the development lot or lots are conditional uses in selected districts.

A. Principal Use General Standards

1. Site Design

a. Setbacks – Community- and large-scale solar arrays must meet the following setbacks:

1. Property line setback for buildings or structures in the district in which the system is located, except as other determined in 1.a.5 below.

2. Roadway setback of 150 feet from the ROW centerline of State highways and CSAHs, 100 feet for other roads, except as other determined in 1.a.5 below.

3. Housing unit setback of 150 feet from any existing dwelling unit, except as other determined in 1.a.5 below.

4. Setback distance should be measured from the edge of the solar energy system array, excluding security fencing, screening, or berm.

5. All setbacks can be reduced by 50% if the array is fully screened from the setback point of measurement.

b. Screening – Community- and large-scale solar shall be screened from existing residential dwellings.

1. A screening plan shall be submitted that identifies the type and extent of screening.

2. Screening shall be consistent with Model Community's screening ordinance or standards typically applied for other land uses requiring screening.

3. Screening shall not be required along property lines within the same zoning district, except where the adjoining lot has an existing residential use.

4. Model Community may require screening where it determines there is a clear community interest in maintaining a viewshed.

Community-Scale Solar or Solar Gardens

Community solar systems differ from rooftop or solar farm installations primarily in regards to system ownership and disposition of the electricity generated, rather than land use considerations. There is, however, a somewhat greater community interest in community solar, and thus communities should consider creating a separate land use category.

This language limits the size of the garden to ten acres, which is an installation of no more than one MW of solar capacity. Communities should tailor this size limit to community standards, which may be smaller or larger.

Appropriate Setbacks

The community should consider balancing setback requirements and screening requirements for principal use solar. Since the primary impact to neighbors of large-scale solar is visual, screening becomes less useful, as the setbacks get larger (and vice versa).

The setback distances provided here are general examples that should be modified to be consistent with other setbacks already in the ordinance. Excessive setbacks that are unique to solar land uses, or that are similar to high nuisance land uses such as industrial uses or animal agriculture, are unjustified given the low level of risk or nuisance posed by the system.

Screening

The community should consider limiting screening of community- or large-scale solar to where there is a visual impact from an existing use, such as adjacent residential districts or uses. Solar energy systems may not need to be screened from adjacent lots if those lots are in agricultural use, are non-residential, or have low-intensity commercial use.

c. Ground cover and buffer areas – The following provisions shall 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 shall include the installation and establishment of 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.

3. The applicant shall submit a vegetation management plan adhering to guidance set forth by the pollinator-friendly scorecard published by the Illinois Department of Natural Resources.

4. Pollinator-friendly standards shall be maintained on the site for the duration of operation, until the site is decommissioned.

5. Model Community may require submittal of inspection fee at the time of the initial fee at the time of the initial permit application to support ongoing inspection of the pollinator-friendly ground cover.

6. The applicant shall 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 shall remain in effect until vegetation is sufficiently established.

7.Plant material must not have been treated with systemic insecticides, particularly neonicontinoids.

Stormwater and Water Quality Standards

Perennial grasses and wildflowers planted under the panels, between arrays, and in setback or buffer areas will substantially mitigate the stormwater risks associated with solar arrays and result in less runoff than typically seen from many types of agriculture. Establishing and maintaining perennial ground cover can have important co-benefits to the community or the property owner. The ground cover standards in Section A.3. will mitigate many stormwater risks, although soil type and slope can still affect the need for additional stormwater mitigation.

Solar with native or perennial ground cover can provide multiple water quality benefits when converting from most agricultural crop uses. Both groundwater (limiting nitrate contamination) and surface waters (reducing phosphorus and sediment loading) can benefit if the system is appropriately designed.

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 eco-system 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.

d. Foundations – A qualified engineer shall certify that the foundation and design of the solar panel racking and support is 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 shall be buried underground. Exemptions may be granted by Model Community 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, at the discretion of the zoning administrator.

f. Fencing – Perimeter fencing for the site shall not include barbed wire or woven wire designs, and shall preferably use wildlife-friendly fencing standards that include clearance at the bottom. Alternative fencing can be used if the site is incorporating agrivoltaics.

2. Stormwater and NPDES — Solar farms are subject to Model Community's stormwater management and erosion and sediment control provisions and NPDES permit requirements. Solar collectors shall 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 solar farms shall 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 shall submit a detailed site plan for both existing and proposed conditions, showing locations of all solar arrays, other structures, property lines, rights-of-way, 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.

Site Plan

Solar farm 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.

5. Aviation Protection —For solar farms 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 qualitative 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.

Aviation Standards, Glare

This standard was developed for the FAA for solar installations on airport grounds. It can also be used for solar farm and garden development in areas adjacent to airports. This standard is not appropriate for areas where reflected light is not a safety concern.

6. Agricultural Protection — Solar farms must comply with site assessment or soil identification standards that are intended to identify agricultural soils, including submitting an Agricultural Impact Mitigation Plan to Model Community and the Illinois Department Agriculture, as required in Illinois Statutes (505ILCS 147, or successor statute). Model Community may require mitigation for use of prime soils for solar array placement, including the following:

a. Demonstrating co-location of agricultural uses (agrivoltaics) on the project site.

b. Using an interim use or time-limited CUP that allows the site to be returned to agriculture at the end of life of the solar installation.

Agricultural Protection

State law requires all solar installations greater than 500 KW must prepare an Agricultural Impact Mitigation Plan, which must be included in the local conditional use permit or other permit. If the community has additional ordinances that protect agricultural soils, this provision applies those same standards to solar development, and offers some solar-specific mitigation opportunities. Communities should understand that solar farms do not pose the same level or type of risk to agricultural practices as does housing or commercial development. Solar farms can be considered an interim use that can be turned back to agriculture at the end of the solar farm'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.

c. Placing agricultural conservation easements on an equivalent number of prime soil acres adjacent to or surrounding the project site.

d. Locating the project in wellhead protection area for the purpose of removing agricultural uses from high risk recharge areas.

7. Decommissioning — A decommissioning plan shall be prepared and submitted as part of the Agricultural Impact Mitigation Plan (505 ILCS 147).

a Decommisioning of the system must occur in the event the project is not in use for 12 consecutive months.

b. The plan shall include provisions for removal of all structures and foundations, restoration of soil andvegetation and consistency with all standards of the AIMP.

c. Disposal of structures and/or foundations shall meet the provisions of the Model Community Solid Waste Ordinance.

d. Financial assurances shall be provided to Model Community consistent with the Illinois Department of Agriculture standard agricultural impact mitigation agreement.

B. Community-Scale Solar – Model Community permits the development of community-scale solar, subject to the following standards and requirements:

Defining Community-Scale Solar

The acreage size for community-scale solar garden written here (10 acres) is the high end of project size for a one megawatt system, but community-scale could be defined as high as 10 megawatts (100 acre project size). Community-scale solar is the size that can fit in to the landscape.

1. Rooftop gardens permitted — Rooftop community systems are permitted in all districts where buildings are permitted.

2. Community-scale uses — Ground-mounted community solar energy systems must cover no more than ten acres (project boundaries), and are a permitted use in industrial and agricultural districts, and permitted with standards or conditional in all other non-residential districts. Ground-mounted solar developments covering more than ten acres shall be considered large-scale solar.

3. Dimensional standards — All structures must comply with setback, and height standards for the district in which the system is located.

4. Other standards — Ground-mounted systems must comply with all required standards for structures in the district in which the system is located.

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 – Solar farms 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.

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.

Example Use Table

Use Type	Residential	Mixed Use	Business	Industrial	Agricultural, Rural, Landfill	Shoreland	Floodplain	Special (Conservation, Historic Districts)
Large-scale solar				C	C	C	C	C
Community-scale solar	C	C	C	P	P	PS	PS	PS
Accessory use ground-mounted solar	P	P	P	P	P	P	C	C
Rooftop solar	P	P	P	P	P	P	P	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 four types of solar development that are distinct types of land uses (two kinds of accessory uses, two principal uses), and a group of districts or overlays that are commonly used in Illinois.

• Rooftop system are permitted in all districts where buildings are permitted, with recognition that historic districts will have special standards or permits separate from the 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 10 acre development can be integrated into the landscape, and requiring special consideration in shoreland and floodplain overlay districts.

• Large-scale is prohibited in higher density districts and conditional in all other districts.

Both community- and large-scale solar is allowed in shoreland and floodplain overlay districts, because the site design standards requiring pollinator-friendly ground cover not only ensure a low-impact development but in most cases result in a restoration of ecosystem services from the previous (usually agricultural) use.

VI. Restrictions on Solar Energy Systems Limited – Consistent with 765 ILCS 165, no homeowners' agreement, covenant, common interest community, or other contract between multiple property owners within a subdivision of Model Community shall prohibit or restrict homeowners from installing solar energy systems. No energy policy statement enacted by a common interest community shall be more restrictive than Model Community's solar energy standards.

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 Statutes, 765 ILCS 165/20

VII. Renewable Energy Condition for Certain Permits

A. Condition for Planned Unit Development (PUD) Approval — Model Community may require on-site renewable energy systems, zero-net-energy (ZNE) or zero-net-carbon (ZNC) building designs, solar-synchronized electric vehicle charging or other clean energy systems as a condition for approval of a PUD permit 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 that are inconsistent with the Model Community Comprehensive Plan.

B. Condition for Conditional Use Permit — Model Community may require on-site renewable energy systems or zero net energy construction as a condition for a rezoning or a conditional use permit.

VIII. Solar Roof Incentives. Model Community encourages incorporating on-site renewable energy system or zero net energy construction for new construction and redevelopment. Model Community may require on-site renewable energy or zero-net-energy construction when issuing a conditional use permit where the project has access to local energy resources, in order to ensure consistency with Model Community's Climate Action Plan.

A. **Density Bonus** — Any application for subdivision of land in the ___ Districts that will allow the development of at least four new lots of record shall be allowed to increase the maximum number of lots by 10% 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.

B. **Solar-Ready Buildings** – Model Community encourages builders to use solar-ready design in buildings. Buildings that submit a completed U.S. 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.

C. **Solar Access Variance** – When a developer requests a variance from Model Community's subdivision solar access standards, the zoning administrator may grant an administrative exception from the solar access standards provided the applicant meets the conditions of 1. and 2. Below:

    1. Solar Access Lots Identified — At least __% of the lots, or a minimum of __ lots, are identified as solar development lots.

    2. Covenant Assigned — Solar access lots are assigned a covenant that homes built upon these lots must include a solar energy system. Photovoltaic systems must be at least three (3) KW in capacity.

    3. Additional Fees Waived — Model Community will waive any additional fees for filing of the covenant.

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 incentive-based 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 "pre-approving" 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.