CITY OF HARRIS
CHISAGO COUNTY, MINNESOTA
ORDINANCE NO. 2024-02

154.34: SOLAR ENERGY

A. PURPOSE AND INTENT

This article applies to all solar installations in Harris. The City has adopted this regulation for the following purposes:

1. **Infrastructure** – Distributed solar photovoltaic systems will enhance the reliability and power quality of the power grid and make more efficient use of Harris's electric distribution infrastructure
2. **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.
3. **Improve Competitive Markets** – Solar energy systems offer additional energy choice to consumers and will improve competition in the electricity and natural gas supply market.

B DEFINITIONS

Definitions for the purpose of this section

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.

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, consistent with Minn. Statutes 216B.1641 or successor statute. A community solar garden may be either an accessory or a principal use.

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

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

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.

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, as defined in Minn. Stat. 500.30 Subd. 3 or successor statute.

Roof-mount – A solar energy system mounted on a rack that is fastened to or ballasted on a structure roof. Roof-mount 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.

Screening – As it applies to Section 154.34 screening is defined as the following.
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 – The panel or device in a solar energy system that collects solar radiant energy and transforms it 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 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.

C PERMITTED ACCESSORY USE

Roof solar energy systems are a permitted accessory use in all zoning districts. Ground solar systems are not allowed in R-1 or R-3 and require an interim use permit in all other districts.

1. **Height** – Solar energy systems must meet the following height requirements:
   a. Building- or roof- mounted solar energy systems shall not exceed the maximum allowed height in any zoning district. For purposes for 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
   b. Ground or pole mounted energy systems shall not exceed 15 feet in height when oriented at maximum tilt

2. **Setback** – Solar energy systems must meet the accessory structure setback for the zoning district and primary land use associated with the lot on which the system is located, except as allowed below
   a. **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.

   b. **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.

3. **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.

a. **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.

b. **Aesthetic restrictions** – Roof-mount or ground-mount 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.

c. **Reflectors** – All solar energy system using a reflector to enhance solar production shall minimize glare form the reflector affecting adjacent or nearby properties.

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

    a. Ground-mount systems shall be exempt from lot coverage or impervious surface standards if the soil under the collector is maintained in vegetation and not compacted.

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

5. **Plan Approval Required** – All ground mounted solar energy systems require a building permit or other permit from the City shall provide site plan for review.

    a. **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-mount system, including the property lines and setbacks.
    b. **Plan Approvals** – All applications for ground mounted solar must be reviewed by the zoning official and Planning Commission review and recommendation.

6. **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.

7. **Compliance with Building Code** – All solar energy systems shall meet approval of local building code officials, consistent with the State of Minnesota Building Code, and solar thermal systems shall comply with HVAC-related requirements of the Energy Code.

3. The City may require landscaping and screening where it determines there is a clear community interest in maintaining a viewshed.

c. **Ground cover and buffer areas** –The following provisions shall be met related to the clearing of existing vegetation and establishment of vegetated ground cover.

1. Large-scale removal of mature trees on the site is discouraged.

2. The project site design shall include the installation and establishment of ground cover meeting the beneficial habitat standard consistent with Minnesota Statutes, section 216B.1642, or successor statutes and guidance as set by the Minnesota Board of Water and Soil Resources (BWSR).

3. The applicant shall submit a planting plan accompanied by a completed "Project Planning Assessment Form" provided by BWSR for review by BWSR or the County SWCD.

4. Beneficial habitat standards shall be maintained on the site for the duration of operation, until the site is decommissioned. The owner of the solar array shall complete BWSR's "Established Project Assessment Form" at year 4 and every 3 years after that, and allow the County SWCD to conduct a site visit to verify compliance

5. The City may require submittal of inspection fee at the time of the initial permit application to support ongoing inspection of the beneficial habitat 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 beneficial habitat standard. The financial guarantee shall remain in effect until vegetation is sufficiently established.

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 the City 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 and planning commission.

2. **Site Plan Required** - A detailed site plan for both existing and proposed conditions must be submitted, showing location 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

8. **Compliance with State Electric Code** – All photovoltaic systems shall comply with the Minnesota State Electric Code

9. **Compliance with State Plumbing Code** – Solar thermal systems shall comply with applicable Minnesota State Plumbing Code requirements.

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

D PRINCIPAL USES

Ground-mounted solar energy systems that are the principal use on the development lot or lots are interim uses in selected districts and require an interim use permit and are not permitted in certain districts. The development of commercial or utility scale solar energy systems where such systems present few land use conflicts with current and future development patterns.

A. Principal Use General Standards

1. Site Design

a. Set-backs – Community and largescale solar arrays must meet the following setbacks:

1. Property line setback for buildings or structures 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 with vegetation that will be taller than the array from the setback point of measurement.

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

1. A landscaping and screening plan is required to be submitted that identifies the location, type and extent of screening.

2. Landscaping and screening shall be consistent with any other City screening ordinance or standards typically applied for other land uses requiring screening.

requested by the City. The site plan should show all zoning districts and overlay districts.

3. **Agricultural Protection** - Solar farms must comply with site assessment or soil identification standards that are intended to identify agricultural soils. Harris 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 that allows the site to be returned to agriculture at the end of life of the solar installation.

    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 a Drinking Water Supply Management Area or wellhead protection area.

4. **Decommissioning** - A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life.

    a. Decommissioning 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 and vegetation and assurances that financial resources will be available to fully decommission the site.

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

    d. The City requires the posting of a bond, letter of credit or the establishment of an escrow account to ensure proper decommissioning. The amount shall be referenced in the City's official fee schedule.

E. **Community-Scale Solar** – The City permits the development of community-scale solar subject to the following standards and requirements

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

2. **Community scale uses** – Ground-mount community solar energy systems must cover no more than 10 acres and are permitted with standards or conditions in all non-residential districts and with and interim use permit in R-2. Ground mount solar developments covering more than 10 of acres of land shall be considered large scale solar and requires further analysis and standards.

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

4. **Other standards** – Ground mount systems must comply with all required standards for structures in the district in which the system is located.

F. Large Scale Solar – Ground mounted solar energy arrays that are the primary use of the lot and is designed for providing energy to off-site users or export to the wholesale market, are permitted under the following standards:

1. **Interim Use Permit** – Large Scale Solar farms are interim uses in rural residential agricultural districts, industrial districts, shoreland and floodplain overlay districts, subject to A.1.5 of this ordinance and must comply with all principal use standards in the city ordinance.

G. Use Table

Use Type	R-1 and R-3	R-2	General Business	Commercial Industrial (CI)	Industrial (I)	Shoreland	Floodplain
Large Scale Solar	NP	I – Lots 20 Acres or more NP - Lots less than 20 acres	NP	NP	I	I	I
Community Scale Solar	NP	I	NP	I	I	I	I
Accessory use ground mounted solar	I	P	P	P	P	I	I
Rooftop solar	P	P	P	P	P	P	P

Key –

NP	Not Permitted
P	Permitted
I	Interim Use Permit Required