

ORDINANCE # 2022 OR-4

AN ORDINANCE ADDING SOLAR ENERGY SYSTEM STANDARDS TO THE PLANNING AND ZONING ORDINANCE.

WHEREAS, the Knox City Council has deemed it necessary and advisable to promote the general health, safety, and welfare of Knox and its Two-Mile Jurisdiction by adopting and implementing an ordinance providing for the requirements for solar energy systems.

WHEREAS, the purpose of this ordinance is to establish the minimum requirements for the development, construction, maintenance, and decommissioning of solar energy systems in Knox, Indiana, and its Two-Mile Jurisdiction.

NOW, THEREFORE, IT IS HEREBY ORDAINED:

I. Scope: This article applies to all solar energy systems installations in Knox, Indiana, and its Two-Mile Jurisdiction.

II. Purpose: This Ordinance provides for the implementation of solar energy systems in Knox and its Two-Mile Jurisdiction, which convert the power of the sun into the generation of electricity. The City of Knox finds that it is in the public interest to regulate the use and development of renewable energy systems. The City of Knox supports the use of solar energy collection systems, and the regulations found in this Ordinance are not intended to severely limit the placement of solar energy systems in Knox and its Two-Mile Jurisdiction. The regulations in this Ordinance are intended to consider the unique needs of solar energy systems and to provide for the most efficient use of this type of renewable energy system. This Ordinance is also intended to protect the character of residential neighborhoods and commercial corridors, as well as to ensure that solar energy systems are placed and constructed in such a way that is harmonious and beneficial to agricultural property.

III. Definitions:

Commercial Solar Energy Systems (CSES) - An area of land or other area used by a property owner, multiple property owners, and/or corporate entity for a solar collection system principally used to capture solar energy, convert it to electrical energy or thermal power, and supply electrical or thermal power, primarily or solely for off-site utility grid use, and consisting of one or more free-standing ground-mounted, solar arrays or modules, battery storage facilities, solar related equipment, and ancillary improvements, including substations.

Private Residential Solar Energy Systems (PRSES) - An area of land or other area used for a solar collection system primarily used to capture solar energy, convert it to electrical energy or thermal power, and supply electrical or thermal power, primarily or solely for on-site residential use, and consisting of one or more free-standing, ground or roof-mounted, solar arrays or modules, or solar related equipment, intended to primarily reduce on-site consumption of utility power and/or fuels. PRSES shall be permitted in all zoning districts and shall be treated as accessory structures in each zoning district in which they are erected.

The maximum size of PRSES is limited to the maximum size allowed for an accessory structure in each zoning district (other accessory structures shall not be included in maximum size calculations).

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 awning.

Grid-Tied 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.

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 Energy- A community- or large-scale solar energy system that meets the requirements of the 2020 Indiana Solar Site Pollinator Habitat Planning Scorecard developed by the Purdue University or another pollinator-friendly checklist developed by a third-party as a solar-pollinator standard designed for Midwestern ecosystems, soils, and habitat.

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 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, typically using a vertically mounted collector on a south-facing wall.

Solar Hot Water System (also referred to as Solar Thermal) - 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.

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

IV. Permitted Districts:

Subject to issuance of a Location and Improvement Permit (herein after "Permit") a CSES may be located only as follows:

- A. Agriculture
- B. General Commercial (C-2), Light Manufacturing (M-1), and Heavy Manufacturing (M-2), if the electricity generated is primarily for on-site use

V. Design Standards for Permitted Accessory Use:

Solar energy systems may be a permitted accessory use in all zoning districts where structures of any sort are allowed, subject to certain requirements as set forth below, and subject to such agreements reached or conditions imposed by the Board of Zoning Appeals and/or the City executive. Electric vehicle charging equipment are a permitted accessory use on surface parking lots in all districts regardless of the existence of another building.

A. Minimum Coverage

- 1. CSES are a minimum of 10 acres in total area.

B. 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 are prohibited in all zoning districts.

C. Setback - Solar energy systems must meet the accessory structure setback for the zoning district and principal 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.

- D. 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, consistent with Indiana Code 36-7-2-8.
- 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-mounted 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 of it 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 not exceed past the ridgeline.
 - 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.
- E. Lot Coverage** - Ground-mounted systems shall not be subject to the existing lot coverage restrictions for the zoning district.
- F. 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 local Historic Preservation Commission, or equivalent consistent with the standards of solar energy systems on historically designated buildings published by the U.S. Department of the Interior.
- G. Approved Solar Components** - Electric solar energy system components must have an Underwriters Laboratory (UL) or equivalent listing and solar hot water systems must have a Solar Rating & Certification Corporation (SRCC) or equivalent rating.
- H. Compliance with Building Code** - All solar energy systems shall meet approval of local building code officials, consistent with the State of Indiana 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 Indiana State Electric Code.
- J. Compliance with State Plumbing Code** - Solar thermal systems shall comply with applicable Indiana State Plumbing Code requirements.

- K. Compliance with City Requirements** - Prior to commencement of construction, an applicant shall obtain necessary City approvals including Site Plan Approval by the Planning Commission, approval by the county Drainage Board as to project drainage and shall be subject to agreements required by the City executive, including but not limited to, Road Use, Economic Development, Drainage, Stormwater, and Decommissioning/Reclamation agreements. Any applicant shall further endeavor and is expected to reach "good neighbor" agreements with property owners affected by and/or committed to the solar system installation.
- L. Utility Notification** - Where applicable, it is recommended that the interconnection application be submitted to the utility prior to applying for required permits. Grid-tied solar energy systems shall comply with interconnection requirements of the applicable regional transmission organization. Off-grid systems are exempt from this requirement.
- M. Well-testing** - Any City or Two-Mile Jurisdiction resident within ½ mile of the solar project may request well-testing at the start of the project and within thirty (30) days after completion of the project, with the cost of the testing borne by the solar energy company.

VI. Principal Uses:

The City of Knox encourages the development of commercial or utility scale solar energy systems where such systems present few land usage conflicts with current and future development patterns.

A. Principal Use General Standards

1. Site Design

a. Setbacks - CSES solar arrays must meet the following setbacks:

- i. Property line setback from a non-participating landowner's property line must meet the established setback for buildings or structures in the district in which the system is located, except as otherwise determined in 1.a.6 below.
- ii. Property line setbacks between separate parcels both of which are participating in the project may be waived upon agreement of the landowner(s).
- iii. Roadway setback of 100 feet from the center of any public road, except as otherwise determined in 1.a.6 below.
- iv. Housing unit setback of 300 feet from any existing dwelling unit of a non-participating landowner, except as otherwise determined in 1.a.6 below, and a minimum of 200 feet from the property line of any non-participating landowner. Participating landowner housing must meet building setbacks for the district in which the project is located.
- v. Setback distance should be measured from the edge of the solar energy system array, excluding security fencing, screening, or berm.

- vi. An individual landowner within the project may waive by written agreement the setback applicable to the landowner's property; however, setbacks can be reduced by no more than 50%. Any un-waived setback cannot be less than 50 feet, if the array has a landscape buffer that screens the array at the setback point of measurement.
- b. **Screening** - CSES shall be screened or buffered from adjacent existing residential dwellings. A buffering plan shall be approved so long as the buffer meets existing City standards.
 - i. A landscape plan shall be submitted that identifies the type and extent of proposed buffer and screening. Vegetation or another type of buffer can be proposed. Any vegetation screening such as pine trees or similar plantings shall be four feet high at the time of planting and shall be spaced no more than 8 feet apart.
 - ii. Screening shall be consistent with the City of Knox's screening ordinance or standards typically applied for other and uses requiring screening.
 - iii. Screening shall not be required along highways or roadways, except as provided in iv. below or along property lines within the same zoning district, except where the adjoining lot has an existing residential use.
 - iv. The City of Knox may require screening where it determines there is a clear community interest in maintaining a viewshed.
- c. **Height** - CSES shall not exceed 20 feet. This height restriction does not apply to any building constructed for maintenance or operations purposes. Installation shall not be located so as to interfere with existing satellite television, cell phone and/or internet service.
- d. **Ground cover and buffer areas** - Ground-mounted CSES are required to adhere to the following standards. Additional site-specific conditions may apply as required by the Knox Planning Commission.
 - i. Ground around and under solar panels and in project site buffer areas shall be planted, established, and maintained for the life of the solar project in perennial vegetated ground cover.
 - ii. To the maximum extent feasible for site conditions, perennial vegetation ground cover shall be based on a diverse seed mix of native species consistent with guidance specific to the local area provided by the Soil and Water Conservation District office or the Indiana Native Plant Society.
 - iii. The owner/operator shall demonstrate site maintenance that is intended to remove invasive or noxious species, as listed by the Indiana Invasive Species Council, without harming perennial vegetation.

- iv. No insecticide use is permitted on the site. This provision does not apply to insecticide or herbicide use on in-site buildings, in and around electrical boxes, spot control of noxious weeds, or as otherwise may be deemed necessary to protect public health and safety.
 - v. Plant material must not have been treated with systemic insecticides, particularly neonicotinoids.
 - vi. CSES that propose to install, establish, and maintain pollinator-friendly vegetative cover are to demonstrate the quality of the habitat by using guides such as Purdue University 2020 Indiana Solar Site Pollinator Habitat Planning Scorecard, or other third party solar-pollinator scorecards designed for Midwestern ecosystems, soils, and habitats.
 - vii. Projects certified and maintained as pollinator-friendly compliant may be exempt from landscaping requirements and post-construction stormwater management controls (as stated in Section V.A.2. below), subject to any agreement reached, and subject to any special conditions imposed by the City executive, the Planning Commission, or the Board of Zoning Appeals.
 - viii. Foundations- A qualified and licensed engineer shall certify prior application for building permits, that the foundation and design of the solar panel racking and support is within accepted and professional standards, given local soil and climate changes.
- e. Power and communication lines -**
- i. 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 of Knox 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 administration.
 - ii. Power and communication lines between the project and the point of interconnection with the transmission system can be overhead, subject to approval of the Planning Commission.
- f. Fencing -** Except for the perimeter of a substation, 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. No wood fencing shall be permitted, although wooden poles may be used with wire fencing. Alternative fencing can be used if the site is incorporating agrivoltaics. All such fencing shall be at a minimum height of 7 feet in accordance with federal law.
- g. Lighting -** Any lights installed anywhere within the project footprint shall not extend lighting more than 50 feet beyond the boundaries of the footprint.

- FEBRUARY 22, 2022

- a. **Decommissioning and Removal.** Any ground-mounted solar energy system which has reached the end of its useful life or has been abandoned shall be removed by the owner. The owner or operator shall physically complete removal of the installation no more than 180 days after the date of discontinued operations, or by a timeframe determined by the Plan Director for extenuating circumstances. Decommissioning shall consist of:
- i. Physical removal of all solar energy system structures and equipment from the site;
 - ii. Disposal of all solid and hazardous waste in accordance with local, state, and federal disposal regulations; and
 - iii. Stabilization or re-vegetation of the site as necessary to minimize erosion. The Planning Administrator or the City executive may enter into an agreement to allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation. However, a Stormwater permit is required for any disturbance over 1 acre in area.
- b. **Abandonment** - Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the ground-mounted solar energy system shall be considered abandoned when it fails to operate for more than six months without the written consent of the Planning Commission.
- c. **Right to Remove** - If the owner or operator of the ground-mounted solar energy system fails to remove the installation in accordance with the requirements of this section within 90 days of abandonment or the proposed date of decommissioning, the City of Knox retains the right, after receipt of an appropriate court order, to enter and remove an abandoned, hazardous, or decommissioned ground-mounted solar energy system. As a condition of issuance of an improvement location permit, the applicant and the landowner agree to allow entry to remove an abandoned, hazardous, or decommissioned installation.
- d. **Security Fund** - Any owner of a ground-mounted solar energy system over 1,000 square feet in panel area shall, on the fifth (5th) anniversary of the date of commercial operation of the solar project, establish a cash security fund, bond, irrevocable letter of credit or other means to secure the payment of removing any abandoned solar energy system, including the solar panels and associated equipment and any buildings that have been determined to be abandoned or found to be in non-compliance with this Ordinance, and to provide the City of Knox a fund from which to deduct fines and penalties for non-compliance with this Ordinance or other applicable laws in the lesser of: (a) the amount of 125% of the Removal Cost, which shall be the cost of demolition and removal of the solar energy system based upon a licensed engineer's estimate of the cost of removal and demolition, less salvage value; or (b) the Removal Cost plus One Hundred and Fifty Thousand Dollars (\$150,000.00). Any

reduction in the security fund provided, because of fines, penalties, or removal costs, shall be replenished to the total of the required amount within 30 days after notice from the City of Knox of the amount deducted and the deficiency created thereby. Within a reasonable period of time, not to exceed 3 months after the solar energy system is removed, any remaining funds on deposit with the City of Knox pursuant to this Ordinance shall be refunded to the appropriate owner who created the security fund.

- i. Decommissioning of the system must occur in the event the project does not produce power for 6 consecutive months. An owner may petition the City executive for an extension of this period upon showing of reasonable circumstances that have caused the delay in the start of decommissioning.
- ii. The plan shall include provisions for removal of all structures and foundations to a depth of 48", restoration of soil and vegetation and assurances that financial resources will be available to fully decommission the site.
- iii. Disposal of structures and/or foundations shall meet the provisions of the City of Knox Solid Waste Ordinance. All solar panels are to be disposed of at a site certified for disposal of solar panels.
- iv. The City of Knox may require the posting of a bond, letter of credit, parent guarantee, or other financial surety to ensure proper decommissioning.
- v. The value of the decommission bond or letter of credit should consider the salvage value of the solar equipment.
 - a. Any decommissioning agreement shall be subject to review every 5 years to ensure the bonding amount will cover costs of decommissioning, and the bonding requirements shall be adjusted accordingly.

VII. Renewable Energy Condition for Certain Permits

- A. Condition for Planned Unit Development (PUD) Approval- The City of Knox 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, and
 4. Other impacts of the proposed development that are inconsistent with the City of Knox Comprehensive Plan.

VII. Private Residential Solar Energy Systems (PRSES)

The Private Residential Solar Energy Systems Standards apply in all zoning districts:

- i. Shall be for on-site use only
- ii. Shall be roof-mounted or constructed in the rear or side yard
- iii. Must have a privacy fence installed around the structure(s)
- iv. Cannot be enclosed underneath to be used for storage
- v. Shall not be constructed over 6 feet in height for ground-mounted arrays.
- vi. Solar Collection devices shall be located such that reflected solar glare shall not be directed onto adjacent structures, properties, or roadways.
- vii. Solar collection devices shall be kept in a state of good repair.
- viii. Inoperable, non-functioning, and poorly maintained solar collection devices shall be removed by the owner, agent, or person having the beneficial use of the building, structure, or zoning lot upon which the solar collection devices are located within 90 days after given notice.
- ix. The applicant must follow same rules as building in a flood plain, including raising elevation of structures if deemed necessary.

XI. Permit Fees

Building Permit Fees, is amended by the addition of Solar Energy System Fees as follows:

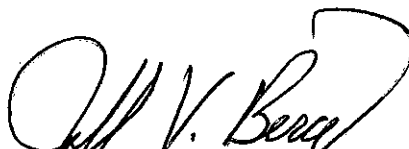
1. CSES Permits

- a. Fees applicable to Site Plan submittal will also be required, as well as any and all other permits as required by Starke County. Amounts due to the City (per the schedule of fees below) shall be prorated based upon the percentage of CSES project solar panels located within the City of Knox and its Two-Mile Jurisdiction.
- b. An ILP application for a CSES permit shall be accompanied by a fee of:
 - i. 0-10 kilowatts \$150.00
 - ii. 11-50 kilowatts \$300.00
 - iii. 51-100 kilowatts \$600.00
 - iv. 101-500 kilowatts \$1,200.00
 - v. 501-1,000 kilowatts \$2,750.00
 - vi. 1,001-2,000 kilowatts \$6,000.00
 - vii. Over 2,000 kilowatts \$6,000.00 + \$200.00 for each additional 1,000 kw
- c. Maximum Fee of \$30,000.00

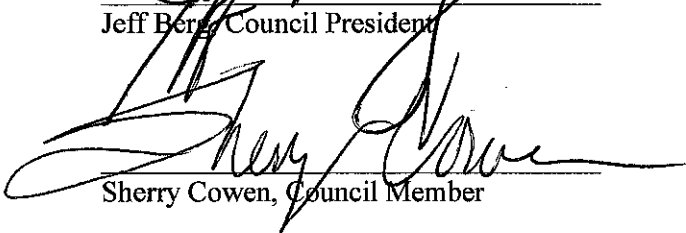
2. PRSES Permits. Application shall be accompanied by an accessory use fee of \$150.00.

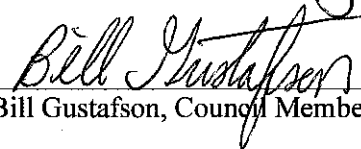
ADOPTED, PASSED AND ORDAINED, BY THE COMMON COUNCIL OF THE CITY OF KNOX,
INDIANA, this 22TH day of February 2022.

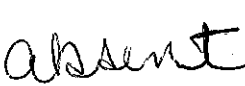
COMMON COUNCIL OF THE CITY OF KNOX:


Jeff Berg, Council President



Don Kring, Council Member


Sherry Cowen, Council Member

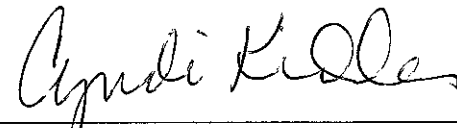

Bill Gustafson, Council Member


Ron Parker, Council Member

Approved by the Mayor this 22th day of February, 2022.


Dennis Estok, Mayor

Attest:


Cyndi Kidder, Clerk-Treasurer