

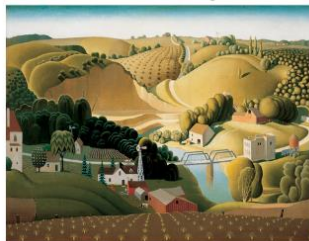
RENEWABLE SOLAR ENERGY SYSTEMS Model Ordinance

Steve Guyer, Iowa Environmental Council
Patrick Snell, The Nature Conservancy



Iowa
Environmental
Council

1000 Friends of Iowa



Citizens United for Responsible Land Use

The Nature
Conservancy 
Protecting nature. Preserving life.®

Contents

1. Purpose	2
2. Definitions	2
3. Personal Solar Energy System (PSES)	3
A. Ground Mount PSES Building Permit Application	3
B. General Requirements	4
4. Solar Thermal Energy System (STES)	4
A. Ground Mount STES Building Permit Application	4
B. General Requirements	4
5. Community Solar Energy System (CSES) and Solar Farm Energy System (SFES)	5
A. CSES and SFES Conditional Use Permit Requirements	5
B. General Requirements	6
C. Operation and maintenance plan.	8
D. Discontinuation and Decommissioning	8
E. Decommissioning Plan:	8

RENEWABLE SOLAR ENERGY SYSTEMS (SES)

1. PURPOSE

The purpose of this section is to facilitate the construction, installation and operation of Solar Energy Systems (SES) in a manner that promotes local renewable energy production and economic development while protecting property values and ensuring the protection of the public health, safety and welfare. Renewable Solar Energy Systems enhance grid reliability and reduce peak power demands.

2. DEFINITIONS

- i. **Active Solar System:** A system of devices for the collection and use of sunlight to generate electricity or to store and circulate heat.
- ii. **Community Solar Energy System (CSES):** A solar energy system developed by a utility or other third party that typically allows community members to subscribe to the project, to produce electricity for retail sales delivering it over its own distributive network.
- iii. **Concentrating Solar Thermal (CST) Devices:** Devices, such as mirrors and lenses, that collect and concentrate radiation from the sun to transform it into high-temperature thermal energy which can be for heating and cooling, heat for processing, material treatments, electricity production, or chemical processes. Concentrating Solar Thermal devices are not an allowed use in any zoning district.
- iv. **Ground-Mounted System:** A system where a rack(s) of panels is mounted on concrete posts or poles anchored in the ground and are wired or plumbed to an adjacent home or structure.
- v. **Personal Solar Energy System (PSES):** A SES that generates power primarily for use on the property on which it is constructed. Often referred to as distributive generation and the owner as a distributive generator.
- vi. **Photovoltaic (PV) Cells:** Semiconductors which generate electricity whenever light strikes them; generally grouped on panels.
- vii. **Solar Access Space:** That airspace above all parcels necessary for a solar collector to access solar energy. Any future improvement, vegetation or tree located on a neighboring parcel shall not cast a shadow upon any solar collector located within said parcel greater than the shadow cast by a hypothetical vertical wall ten (10) feet high located along the property line between said parcels between the hours of 9:30 a.m. and 3:30 p.m., Central Standard Time on December 21. Existing improvement(s), tree(s), or other vegetation that cast a shadow upon a solar collector at the time of installation of said solar collector shall be allowed to remain.
- viii. **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.

- ix. **Solar Easement:** An easement created to protect a solar project from encroachment by adjacent properties which would shade panels. See Iowa Code §564A.
- x. **Solar Energy:** Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.
- xi. **Solar Energy System (SES):** Solar collectors, controls, energy storage devices, heat pumps, heat exchangers, and other materials, hardware or equipment necessary to the process by which solar radiation is collected, converted into another form of energy, stored, protected from unnecessary dissipation, and distributed. Solar energy systems include solar thermal, photovoltaic and concentrated solar.
- xii. **Solar Farm Energy System (SFES):** A commercial facility that converts sunlight into electricity, whether by photovoltaic (PV), concentrating solar thermal devices (CST), or other conversion technology for the primary purpose of wholesale sales of generated electricity.
- xiii. **Solar Panel:**
 - 1. A grouping of photovoltaic cells used to generate electricity directly from sunlight. A grouping of these panels is called an array.
 - 2. A panel circulating water or other liquid through tubes to collect, transfer and store the sun's heat for domestic hot water and building heat.
- xiv. **Solar Storage Battery:** A device that stores energy from the sun and makes it available in an electrical form.
- xv. **Solar Storage Unit:** A component of a solar energy device that is used to store solar-generated electricity or heat for later use.
- xvi. **Solar Thermal Energy System (STES):** A system that directly heats water or other liquids using sunlight. The heated liquid is used for such purposes as space heating and cooling, domestic hot water, and heating pool water.
- xvii. **Structure-Mounted Solar Energy System:** A system where photovoltaic panels or solar thermal panels are mounted on racks attached to the roof or side-walls of a building. Panels can be flush-mounted or angled for optimal sun exposure.

3. PERSONAL SOLAR ENERGY SYSTEM (PSES)

Personal Solar Energy Systems provide electrical power for on-site use by the owner and shall be considered an accessory use to a principal permitted use in any zoning district. A structure mounted PSES requires an electrical permit but does not require a building permit. Construction of a ground mounted PSES requires a building permit. If the ground mounted PSES does not meet all requirements, the applicant may apply for a variance.

A. Ground Mount PSES Building Permit Application

The applicant(s) requesting the building permit will provide the following information:

- i. Name, address and contact information of applicant(s).
- ii. Plot plan sketch indicating: (a) property lines and physical dimensions of the subject property, (b) location and types of existing major structures on the property, (c) location of the proposed solar panels, (d) the right-of-way of any public road that is contiguous with the property.
- iii. Solar system specifications including (a) manufacturer and model of solar panels and inverters, (b) kW (AC) rating, (c) mounting system, (d) solar storage units, if applicable.

B. General Requirements

- (1) Ground-mounted PSES height shall not be greater than twenty (20) feet at maximum tilt of the solar panel(s) in any zoning district.
- (2) Structure-mounted PSES height shall not be greater than the allowable height of any structure within the zoning district in which the PSES is to be installed.
- (3) Setbacks: PSES shall meet the setback requirements for accessory structures in the zoning district where the PSES is located.

4. SOLAR THERMAL ENERGY SYSTEM (STES)

Solar Thermal Energy Systems provide heated fluids for on-site use by the owner and shall be considered an accessory use to a principal permitted use in any zoning district. A structure mounted STES requires a plumbing permit but does not require a building permit. Construction of a ground mounted STES requires a building permit. If the ground mounted STES does not meet all requirements, the applicant may apply for a variance.

A. Ground Mount STES Building Permit Application

The applicant(s) requesting the building permit will provide the following information:

- i. Name, address and contact information of applicant(s).
- ii. Plot plan sketch indicating: (a) property lines and physical dimensions of the subject property, (b) location and types of existing major structures on the property, (c) location of the proposed solar thermal energy system and proposed pipelines to the structure utilizing the STES, (d) the right-of-way of any public road that is contiguous with the property.
- iii. Solar thermal energy system specifications including (a) manufacturer and model of solar panels, (b) mounting system.

B. General Requirements

- (1) Ground-mounted STES height shall not be greater than twenty (20) feet at maximum tilt of the solar panel(s) in any zoning district.
- (2) Structure-mounted STES height shall not be greater than the allowable height of any structure within the zoning district in which the STES is to be installed.
- (3) Setbacks: STES shall meet the setback requirements for accessory structures in the zoning district where the STES is located.

5. COMMUNITY SOLAR ENERGY SYSTEM (CSES) AND SOLAR FARM ENERGY SYSTEM (SFES)

Community Solar Energy Systems and Solar Farm Energy Systems are not allowed in residential zoning districts, but are allowed by Conditional Use Permit in all other zoning districts. The applicants must be the landowner(s) of the property, lessee(s), and the project owner(s), as applicable, of the proposed CSES or SFES. For projects 25 MW or larger, the Application for a Certificate, required by the Iowa Utilities Board will be considered acceptable to meet the information requirements listed below for the Conditional Use Permit.

A. CSES and SFES Conditional Use Permit Requirements

- i. Names, addresses and contact information of the landowner(s), lessee(s), developer(s) and project owner(s), as applicable, and a listing of all CSES and SFES owned or operated by said developer. The application shall designate the entity who will be the construction permit holder.
- ii. Landowner applicants must provide a deed or other proof of ownership of the property. The developer applicants must provide a lease or other agreement with the landowner applicants.
- iii. Surveyed legal description, boundaries and total acreage of proposed CSES or SFES project.
- iv. Map to scale of existing conditions of the property including (a) contour lines at ten (10) foot intervals, (b) existing vegetation, (c) existing drainage and permanent water areas, (d) existing structures and wells on the property.
- v. Map to scale of proposed CSES or SFES including (a) placement of all modules including GPS coordinates of the center of the project area, (b) layout and size of all structures on the property, (c) setback lines, (d) feeder lines and other utility lines, both buried and above ground, interconnection points with existing electrical grid, (f) existing easements, (g) roadways.
- vi. Description of the project: (a) number of modules, (b) manufacturer, (c) mounting type, (d) system height, (e) system capacity, (f) total land area covered by the system, (f) information about associated facilities such as but not limited to substations, feeder lines, solar storage batteries, or other solar storage units.
- vii. CSES or SFES shall conform to applicable industry standards, including those from the

Underwriters laboratory (UL) and Federal Aviation Administration (FAA). All applicable county, state, and national construction and electrical codes shall be followed.

- viii. Documentation of easement locations acquired for solar energy systems and associated facilities including easements to assure solar access space from adjacent property owners, as specified in Iowa Code 564A, for the life of the project.
- ix. Compliance with all siting and location regulations specified as a General Requirement.
- x. Any additional information required by the Zoning Administrator and/or Board of Adjustment.

Construction of a CSES or SFES shall not commence until the Conditional Use Permit has been issued and a Decommissioning Performance Bond has been delivered to the Auditor.

B. General Requirements

(1) Height of solar panel(s) shall not exceed twenty (20) feet at maximum tilt of the solar panel(s).

(2) Setbacks

- (a) The setbacks shall be a minimum of twenty five (25) feet from the property lines which form the outside perimeter of a CSES or SFES project area and one hundred (100) feet from a residence that is a part of the CSES or SFES project area. However, to the extent that a written waiver is permitted, the standard setbacks and separation requirements may be reduced if the participating or adjoining property owner affected by the reduced setback or separation completes a written waiver recorded with the County Recorder.
 - (b) CSES or SFES to be built on more than one parcel, and parcels are abutting, a zero (0) side or rear setback shall be permitted to the property line in common with the abutting parcel(s).
 - (c) Solar panels shall be at least two hundred (200) feet from a residence that is not part of the CSES or SFES project area.
 - (d) Solar panels shall be eighty (80) feet from State rights-of-way and twenty five (25) feet from County rights-of-way.
- (3) Screening: A landscape buffer may be required to be installed and maintained during the life of the operation. Determination of screening requirements will be made as part of the Conditional Use Permit review and approval process and will be based on adjacent or nearby surrounding land uses and topography.
- (4) Fencing: An NEC compliant security fence must be installed along all exterior sides of the CSES or SFES. Fencing that is compatible with wildlife such as deer fencing is preferential at all CSES and SFES. Security fences, gates and warning signs must be

- maintained in good condition until the utility scale solar installation is dismantled and removed from the site.
- (5) Lighting: If lighting is provided for the CSES or SFES, lighting shall be shielded and downcast such that the light does not project directly onto the adjacent parcels nor into the night sky.
 - (6) Signage: All CSES or SFES shall provide the following at all locked entrances: (a) a visible "High Voltage" warning sign, (b) name(s) and phone number(s) for the electric utility provider, (c) name(s) and phone number(s) for the site operator, (d) the facility's 911 address, (e) a lock box with keys as needed.
 - (7) Utility connections: Reasonable efforts shall be made to place all utility connections from the solar installation underground, depending on appropriate soil conditions, shape and topography of the site, distance to the connection, or other conditions or requirements.
 - (8) Outdoor storage: Only the outdoor storage of materials, vehicles, and equipment that support the operation and maintenance of the CSES or SFES shall be allowed.
 - (9) Endangered species and wetlands: Applicant shall seek natural resource consultation with the County Conservation Board and the Iowa Department of Natural Resources.
 - (10) Ground cover, buffer areas and weed control: Ground around and under solar arrays and in project site buffer areas shall be planted and maintained in perennial vegetated cover and meet the following standards:
 - (a) Top soils shall not be removed during development, unless part of a remediation effort.
 - (b) Soils shall be planted and maintained in perennial vegetation to prevent erosion, manage runoff, and build soil. Seeds should include a mix of grasses and wildflowers, ideally native to the region of the project site that will result in a short stature prairie with a diversity of forbs or flowering plants that bloom throughout the growing season. Blooming shrubs may be used in the buffer areas as appropriate for visual screening.
 - (c) Seed mixes and maintenance practices should be consistent with the recommendations made by qualified natural resource professionals such as those from the Iowa Department of Natural Resources, County Soil and Water Conservation District, or USDA Natural Resources Conservation Service.

C. Operation and maintenance plan.

In addition to the information submitted as a part of the CSES or the SFES conditional use permit, the applicant shall submit a plan for the operation and maintenance of the solar installation, which shall include measures for maintaining safe access to the installation, stormwater and erosion controls, as well as general procedures for operation and maintenance of the installation.

D. Discontinuation and Decommissioning

A CSES or SFES shall be considered a discontinued use after the project is terminated, or after one (1) year without production or storage of energy or use as a capacity resource. Once a developer/owner has determined that the facility will no longer be used, the developer/owner must notify the issuing authority of the Conditional Use Permit of the intent to stop using the facility and to decommission the facility in accordance with the agreed-upon Decommissioning Plan.

All CSES or SFES panels, arrays, fencing, underground cables, and accessory facilities shall be removed to a depth of six (6) feet within twelve (12) months of discontinued use.

Discontinued use does not apply to the pre-construction or construction period and shall be measured from the initial commercial energy production and operation of the CSES or SFES. If, however, the CSES or SFES construction permit is revoked, the project will be designated a discontinued use, and construction shall be removed to a depth of six (6) feet below ground level and the surface restored within six (6) months of the permit revocation.

E. Decommissioning Plan:

In addition to the information submitted as a part of the CSES or the SFES conditional use permit, the applicant shall submit a Decommissioning Plan outlining the anticipated means and cost of removal at the end of its serviceable life or upon becoming a discontinued use. The plan shall include:

1. The anticipated life of the CSES or SFES solar installation; the anticipated manner in which the project will be decommissioned; the anticipated site restoration actions; the estimated decommissioning costs in current dollars; and the method for ensuring that funds will be available for decommissioning and restoration.
2. The applicant shall provide the basis for estimates of net costs for decommissioning the site (decommissioning costs less salvage value). The cost basis shall include a mechanism for calculating adjusted costs over the life of the project.
3. Restoration or reclamation activities shall include, but not be limited to, the following:
4. Restoration of the pre-construction surface grade and soil profile after removal of structures, equipment, graveled areas and access roads.
5. Re-vegetation of restored soil areas with crops, native seed mixes, plant species suitable to the area.
6. The plan may incorporate agreements with the landowner regarding leaving access roads, fences, gates or repurposed buildings in place or regarding future property use. Any use of remaining structures must be in conformance with the regulations in effect at that time.



**Iowa
Environmental
Council**

1000 Friends of Iowa



Stone City, Iowa 1909 Great Wood, 1891-1942

Citizens United for Responsible Land Use

**The Nature
Conservancy** 

Protecting nature. Preserving life.®