

# Whitley County Solar Farm Presentation

Solar Handout



Source: <https://chariotenergy.com/chariot-university/solar-farms/>

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## Data for Review:

- IU ERI Model Solar Ordinance
  - <https://eri.iu.edu/documents/in-solar-ordinance-2020-december.pdf>
- IU ERI Renewable Energy Guide
  - <https://eri.iu.edu/documents/in-renewable-energy-guide.pdf>
- APA PAS Memo "Planning for Utility-Scale Solar Energy Facilities"
  - <https://www.planning.org/pas/memo/2019/sep/>
- APA PAS Report "Planning for Solar Energy"
  - <https://www.planning.org/publications/report/9117592/>
- Planning & Zoning Best Practices for Large Scale Solar Development Webinar by SolSmart
  - <https://www.youtube.com/watch?v=iPCcB-5kLo0&app=desktop>
- NREL "Top Five Large-Scale Solar Myths"
  - <https://www.nrel.gov/state-local-tribal/blog/posts/top-five-large-scale-solar-myths.html>
- NC Clean Energy Technology Center "Health and Safety Impacts of Solar Photovoltaics, May 2017"
  - [https://nccleantech.ncsu.edu/resource\\_library/health-and-safety-impacts-of-solar-photovoltaics-pv/](https://nccleantech.ncsu.edu/resource_library/health-and-safety-impacts-of-solar-photovoltaics-pv/)
- Property Value Impact Study Proposed Solar Farm in Mclean County, IL
  - <https://www.mcleancountyil.gov/DocumentCenter/View/13192/Patricia-L-McGarr--Property-Value-Impact-Study?bidId=>
- PV Plant Decommissioning Salvage Value, Conceptual Cost Estimate
  - <https://www.epri.com/#/pages/product/3002013116/?lang=en-US>
- Solar PV Module End of Life: Options and Knowledge Gaps for Utility-Scale Plants
  - <https://www.epri.com/#/pages/product/00000003002014407/?lang=en-US>
- NIPSCO Integrated Resource Plan
  - <https://www.nipsco.com/our-company/about-us/regulatory-information/irp>
- SEIA Solar Investment Tax Credit Factsheet

- <https://www.seia.org/initiatives/solar-investment-tax-credit-itc>
- NREL Beneath Solar Panels, the Seeds of Opportunity Sprout
  - <https://www.nrel.gov/news/features/2019/beneath-solar-panels-the-seeds-of-opportunity-sprout.html>
- Principles of Low Impact Solar Siting and Design
  - [https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/Documents/ED\\_TNCNCPrinciplesofSolarSitingandDesignJan2019.pdf](https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/Documents/ED_TNCNCPrinciplesofSolarSitingandDesignJan2019.pdf)
- Silvey Farms (Kokomo) Annual Comparison
  - <https://www.sunnyportal.com/Templates/PublicPageOverview.aspx?page=275f813a-a368-4b4f-963f-c978d9f1dbe6&plant=b6a1c9be-fe02-4043-a143-8bf749a01e30&splang=en-US>
- State Utility Forecasting Group (2019)
  - <https://www.purdue.edu/discoverypark/sufg/docs/publications/2019%20forecast%20final.pdf>
- Clinton County APC Solar Farm Proposal
  - <https://www.wlfi.com/content/news/Clinton-County-APC-makes-first-of-many-steps-towards-solar-farm-568231791.html>
- Wind Energy Can Help American Farmers Earn Money Avoid Bankruptcy (Wind, but could be applied to Solar)
  - <https://www.usatoday.com/story/news/nation/2020/02/16/wind-energy-can-help-american-farmers-earn-money-avoid-bankruptcy/4695670002/>
- An Overview of Potential Environmental, Cultural, and Socioeconomic Impacts and Mitigation Measures for Utility-Scale Solar Energy Development
  - [https://www.evs.anl.gov/downloads/Solar\\_Environmental\\_Impact\\_Summary.pdf](https://www.evs.anl.gov/downloads/Solar_Environmental_Impact_Summary.pdf)
- Study: Indiana Could Benefit from More Renewable Energy
  - [https://www.insideindianabusiness.com/story/41596962/study-indiana-could-benefit-from-more-renewable-energy?fbclid=IwAR3QIACpZk-24t0lRtLmbXXP4xwEVB6FzVHaAUp8aB8SJzzq8L\\_jE-bXA4](https://www.insideindianabusiness.com/story/41596962/study-indiana-could-benefit-from-more-renewable-energy?fbclid=IwAR3QIACpZk-24t0lRtLmbXXP4xwEVB6FzVHaAUp8aB8SJzzq8L_jE-bXA4)
- From Steel to Solar and Soccer: Mixed-Use Redevelopment in Indiana
  - <https://semspub.epa.gov/work/HQ/100001787.pdf>
- DOE Solar Market Overview
  - Attached PDF.
- Indiana Code Title 36 (Local Government) Article 7 (Planning and Development)
  - <http://iga.in.gov/legislative/laws/2019/ic/titles/036/#36-7>

# Marshall County Ordinance Requirements

## Article Three

### 120 Land Use Matrix

Solar Energy systems	A-1	A-2	A-3	T-1	L-1	C-1	C-2	I-1	I-2	MH	PUD
Roof Mounted Micro-Scale and Small-Scale	P	P	P	P	P	P	P	P	P	P	D
Ground Mounted Micro-Scale and Small-Scale	P	P	P	P	P	P	P	P	P	P	D
Roof Mounted Medium-Scale and Large-Scale	P	P	P			P	P	P	P		
Ground Mounted Medium-Scale and Large-Scale	S	S	S			S	S	S	S		
Farm-Scale	S							S	S		

## Article Six

### 210 Solar Energy Systems

#### A. Intent

In order to protect the public health, safety, and general welfare of the community while accommodating the energy needs of residents and businesses, these regulations are necessary in order to:

1. Bring the benefits of solar energy to Marshall County, including the potential to add local jobs, reduce energy bills, and reduce pollution in a manner that preserves reliability and affordability;
2. minimize adverse effects of SES facilities through careful design and siting standards;
3. avoid potential damage to adjacent properties from SES failure through structural standards and setback requirements.
4. A Solar Energy System is considered a Primary Use if there is no other Primary Use on site.

#### B. Authority

The Marshall County Planning Office is vested with the authority to review, approve, and disapprove applications for Solar Energy Systems, including a sketch, preliminary plans and final plans

#### C. Public Purpose

Regulations of the siting of SES facilities is an exercise of valid police power delegated by the State of Indiana. The developer has the duty of compliance with reasonable conditions laid down by the Marshall County Plan Commission.

#### D. Types and Sizes of Solar Energy Systems

##### 1. Types

- a. Roof Mounted: a Solar Energy System, including but not limited to the panels and mounting system, that is affixed, set, or placed on the roof of a Primary or Accessory Structure.
- b. Ground Mounted: a Solar Energy System that is self-supporting and set into or on the ground.

## 2. Sizes of Solar Energy Systems

- a. Shall be measured by the total surface area of all the panels and is referenced below in panel square feet.
- b. Micro-Scale Solar Energy System: A Solar Energy System that occupies less than 120 square feet of panel area (Standalone systems are exempt such as flag pole lights, single solar lights, etc.)
- c. Small-Scale Solar Energy System: A Solar Energy System that occupies 1,750 square feet of panel area to 120 square feet.
- d. Medium-Scale Solar Energy System: A Solar Energy System that occupies more than 1,750 square feet but less than 43,560 square feet of panel area.
- e. Large-Scale Solar Energy System: A Solar Energy System that occupies more than 43,561 square feet, but less than 435,600 square feet of panel area.
- f. Farm-Scale Solar Energy System: A Solar Energy System that occupies 435,601 square feet of panel area or more.

## E. General Approval Standards

### 1. Setbacks:

- a. Ground Mounted Micro-Scale, Small-Scale, Medium-Scale, and Large-Scale Solar Energy Systems in all districts shall be installed either in the Side Yard, Second Street Front Yard, or Rear Yard when considered Accessory Structures. Ground-Mounted Solar Energy Systems may be located no closer than the setback for their Zoning District.
- b. Ground Mounted Micro-Scale, Small-Scale, Medium-Scale, and Large-Scale Solar Energy Systems that are primary uses on property shall meet the District Setback standards.
- c. Farm-Scale Solar Energy Systems shall be setback 150' from the centerline of the adjacent Right-of-Ways, 75' from all property lines and 250' from the nearest corner of residential structures. Interior project property lines don't have setback requirements.

### 2. Height:

- a. Roof Mounted: Roof-Mounted Solar Energy Systems may exceed the maximum building height, provided the SES does not exceed five feet in height above the roofline in residential districts and ten feet above the roof line in all other districts.
- b. Ground Mounted: The maximum height of PV module and racking system shall not exceed 15' as measured from the highest natural grade below each solar panel. The recommend minimum height from grade is 3' for pollinator species to grow without obstructing the panel efficiency.

### 3. Lot coverage:

The area covered by Ground Mounted Solar Energy Systems, measured by a rectangle encompassing the various system components, where the ground beneath is permeable or pervious, shall not be included in calculations for lot coverage or impervious cover.

The Applicant shall plant a pollinator species with a mix approved by a local licensed landscape architect or equivalent. The Michiana Council of Governments requirements for pollinator species for solar installations shall be referenced. The site shall be planted and maintained to be free of all invasive species, as listed by the Indiana Invasive Species Council.

### 4. Drainage:

Solar Energy Systems must meet the requirements of the Marshall County Storm Drainage and Sediment Control Ordinance.

### 5. Additional Farm Scale Conditions:

#### a. Buffer Requirements:

a). Shall provide adequate visual 4 season screen while within 250' setback from residences and when adjacent to roadway intersections.

b). Buffering shall be maintained by trimming if necessary, removal of dead or fallen trees and replanting.

\*c). Buffering shall be considered when adjacent, non-residential parcels may have competing uses.

b. Must be approved by the Marshall County Drainage Board and the system must be a minimum 75' away from any county ditch or tile.

c. Must repair, reroute or install new tile private Drainage Systems in order to preserve the overall drainage integrity.

d. Must be reviewed by the Technical Review Committee

e. Must meet floodplain regulations.

f. All ground mounted electrical and control equipment shall be labeled and secured to prevent unauthorized access.

g. Exterior lighting shall be limited to that required for safety and operational purposes and will not produce glare across lot lines onto properties not associated with the project and minimized for same property residences.

h. The Applicant shall certify that the Applicant will comply with the Damage to Underground Facilities Law (Ind. Code 8-1-26) and accompanying regulations of the Indiana Utility Regulatory Commission

i. A decommissioning agreement must be executed by the Applicant.

- j. A traffic management plan shall be approved by the Marshall County Highway Superintendent/ Marshall County Commissioners.
- k. A property operation and maintenance plan shall be submitted with the Special Use application.
- l. The facility shall have a perimeter security fence. The security fence must be kept repaired, painted and maintained in good condition.
- m. Signage on the solar farm fencing shall display the facility name, address and emergency contact information.
- n. Must provide reasonable accessibility for emergency vehicles.
- o. Top soil shall be preserved on site and grading should be minimized to preserve the future viability of plantings, and natural contours of the property must be maintained.
- p. Deforestation shall be minimized and approved by the Plan Director and Board of Zoning Appeals.
- q. Energy Storage installations must meet the associated development standards.
- r. Wildlife and Mitigation study or similar as required by applicable state or federal department shall be submitted. Should neither state or federal departments require such a study, the county will require best practices and impact mitigation to be shown and indicated by report or site design.
- s. Preferred locations for Solar Farms and other large-scale solar installations are on Brownfields, industrial zoned property.
- t. Electric solar energy system components must have a UL or equivalent listing.
- u. 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 Marshall County in instance 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 Plan Director.
- v. For solar farms located within 500 feet of an airport or within approach zones of an airport, the applicant must complete and provide the result 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.

## F. Permitting

1. A complete building permit application for all Solar Energy Systems will include the following:
  - a. Solar System Specifications including manufacturer and model information
  - b. Module design and site plans
  - c. Business plan indicating how all conditions will be addressed
  - d. System components including panels, inverters, batteries, etc. should be a minimum 95% recyclable.
2. A Technical Review Committee (TRC) site plan approval is required for Medium-Scale, Large-Scale, and Farm -Scale Solar Energy Systems prior to building permit approval.
3. System upgrades/replacement will require a new building permit.

## G. Site Plan

Site Plan documents shall include, but not limited to signed off by a licensed Engineer in the State of Indiana:

1. Property lines and physical features, including roads, for the project site;
2. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
3. Drawings of the Solar Energy System showing the proposed layout of the system, the distance between the proposed solar collector and all property lines, and the tallest finished height of the solar collector;
5. Name, address of property owners;
6. Zoning District designation for the parcel(s) of land comprising the project site.
7. Documentation that the Applicant has submitted notification to the utility company of the Applicant's intent to install an interconnected customer-owned generator. Off - grid systems are exempt from this requirement.

## H. Abandonment and Decommissioning Requirements

1. Small-Scale, Medium-Scale, and Large-Scale removal requirements:

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 or operator]. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Marshall County Plan Department by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:



a). Physical removal of all Solar Energy Systems, structures, and equipment from the site.

b). Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.

c). Stabilization or re-vegetation of the site as necessary to minimize erosion.

The Marshall County Plan Director may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

## 2. Small-Scale, Medium-Scale, and Large-Scale abandonment:

Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the Small-Scale, Medium-Scale or Large-Scale Ground-Mounted Solar Energy System shall be considered abandoned when it fails to operate for more than one year without the written consent of the Marshall County Plan Department. If the owner or operator of the Solar Energy System fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the County retains the right to enter and remove an abandoned, hazardous, or decommissioned Small-Scale, Medium-Scale, or Large-Scale Ground Mounted Solar Energy System at the owner/operator's expense. As a condition of Site Plan approval, the Applicant and property owner shall agree to allow entry to remove an abandoned or decommissioned installation.

## 3. Farm-Scale construction, decommissioning and removal requirements:

a). Prior to the issuance of a building permit, a decommissioning plan must be approved by the Board of Zoning Appeals and recorded with the Marshall County Recorder, cross-referenced to the deed(s) to all associated project parcels. Once a project has not generated energy for 1 month the developer/owner shall notify the Marshall County Plan Commission Director. Once a facility has not generated power for 6 consecutive months, the decommissioning plan shall be activated. Shall provide the Plan Director and the County Commissioners a semi-annual generation report.

b). The decommissioning plan will include, but is not limited to, the following:

1. Lifetime of the project

2. Timeline for construction, and general operation

3. Decommissioning cost estimate, including salvage value of materials.

4. Restoration and reclamation requirements shall adhere to the following:

i. restoration of the pre-construction surface grade and soil

profile after removal of the structures, equipment, graveled areas and access roads. Sub-grade components shall be removed from a depth of 3' and shallower, and encourages total removal.

ii. re-vegetation of restored soil areas with crops, native seed mixes, plant species suitable to the area.

iii. for any part of the Solar Energy System on leased property, the plan may incorporate agreements with the landowner regarding leaving access roads, fences, gates or repurposed buildings in place or regarding restoration of agricultural crops or forest resource land. Any remaining structures must be in conformance with all ordinances and regulations in effect at the time of decommissioning. Copies of said agreements must be provided as a part of the decommissioning plan pending approval of the Marshall County Plan Director.

5. Bonds or financial assurance are required:

i. Bond or financial assurance that will cover the reconstruction of public infrastructure due to construction activity related to the Solar Energy System installation that will be approved in association with the traffic management plan.

ii. Bond or financial assurance that will cover damage to the drainage infrastructure that may be damaged during the construction process beginning once construction has been completed and is to last for 5 years once construction has been completed.

iii. Bond or financial assurance that will cover the decommissioning of the Solar Energy System as described in the decommissioning plan.

iv. Bonds and financial assurance shall be reevaluated every 3 years with contributions adjusting at that time to cover costs at the time of decommissioning.

v. The amount of the Bonds or financial assurances must be approved by the Marshall County Commissioners.

## Article 13 Definitions

### Solar Energy System (SES)

Solar Energy System: Any device or structural design feature whose primary purpose is to generate energy for interior lighting or provide for the collection, storage, or distribution of solar energy for space heating, space cooling, electricity generation, or water heating.

### Fees

#### Solar permits

Micro-less than 120 square feet	\$ 40
Small – 120 to 1750 square feet	\$ 80
Medium – 1751 to 43,560 panel square feet	\$150
Large – 43,561 to 435,600 panel square feet	\$250
Farm – 435,601 panel square feet or more	\$25/acre