



AGRIVOLTAICS IN ILLINOIS



A REGULATORY AND POLICY GUIDE

Bock Agricultural Law & Policy Program

University of Illinois Urbana-Champaign

Jessica Guarino & Tyler Swanson

This guide is current as of January 1, 2023. Laws and regulations frequently change, and before relying on this information, it is best practice to consult with an attorney.

TABLE OF CONTENTS

- I. Introduction to Agrivoltaics in Illinois Policy and Regulatory Guide**
- II. Historical Background of Agri-Solar Development in Illinois**
- III. Local-Level Agrivoltaics Policy and Regulation**
 - A. Overview of Regulatory Requirements by County-Level Ordinances
 - B. Local-Level Solar Definitions
- IV. Illinois State-Level Agrivoltaics Policy and Regulation**
 - A. The Agricultural Areas Conservation and Protection Act
 - B. The Sustainable Agriculture Act
 - C. Renewable Energy Facilities Agricultural Impact Mitigation Act
 - D. Illinois Municipal Code

About the Program

The C. Allen and Darren A. Bock Agricultural Law and Policy Program studies emerging topics in food and agricultural law with the goal of providing critical legal and policy analysis to inform better decision making and government policy. Previous publications from the Bock Program on the topic of Agrivoltaics include [Emerging Agrivoltaic Regulatory Systems: A Review of Solar Grazing](#) published in the Chicago-Kent Journal of Environmental Law (2022) and *The Rise of Agrivoltaics* published in Q Magazine (*forthcoming* 2023). The Bock website can be found at: <https://publish.illinois.edu/acesbockprogram/>.

About the Authors

Tyler Swanson



Tyler is a senior at the University of Illinois Urbana-Champaign majoring in Agricultural & Consumer Economics with a concentration in Environmental Economics & Policy and minors in Sustainability, Energy, & Environment and Urban Planning. Tyler's research focuses on rural economic development, with a focus in studying the potential impacts of renewable energy on rural economies.

Jessica Guarino



Jessica Guarino is a Postdoctoral Legal Research Associate with the Bock Program. She earned her J.D. and LL.M. in Food and Agricultural Law at the University of Arkansas, Fayetteville and is licensed to practice in California. Jessica engages in research and writing in the fields of agricultural, food, and environmental law, with focuses on the regulatory structure at the nexus of renewable energy and agriculture and justice issues within the agricultural production system.

I

Introduction to Agrivoltaics in Illinois: Policy and Regulatory Guide



Agrivoltaics is defined as the co-location of agricultural and renewable energy production on the same plot of land, allowing land to be used for generating solar energy and food production.¹ Agrivoltaics takes many forms: crop production under solar panels, the cultivation of pollinator-friendly grasses on solar sites, and livestock grazing on solar sites.² The development of agrivoltaics provides opportunities for a wide range of stakeholders: farmers can add a stream of income to their operation by leasing land to solar developers while continuing to farm the soil; rural communities can contribute to a cleaner energy supply without sacrificing their agricultural identity; and solar developers can improve their relationships with rural communities while saving expenditures on vegetation control.³⁴

Importantly, the growth of agrivoltaics does face challenges, particularly around zoning policy. Because agrivoltaics is a new concept that has only recently come into the legal lexicon, policymakers at all levels of government have been slow to respond to this emerging practice. Despite movement on the renewable energy front and solar siting efforts, the lack of established policy for agrivoltaics and dual-use is especially pronounced at the local level, where zoning laws for solar energy differ widely depending on the county (if they exist at all).

¹ Stephan Schindele, *Implementation of Agrovoltatics: Techno-economic Analysis of the Price-Performance Ratio and its Policy Implications*, APPLIED ENERGY (2020).

² *Id.*

³ NIKOLA KOCHENDOERFER ET AL., THE AGRICULTURAL, ECONOMIC AND ENVIRONMENTAL POTENTIAL OF CO-LOCATING UTILITY SCALE SOLAR WITH GRAZING SHEEP, DAVID R. ATKINSON CENTER FOR A SUSTAINABLE FUTURE 4 (2019), <https://solargrazing.org/wp-content/uploads/2021/02/Atkinson-Center-Full-Report.pdf> [<https://perma.cc/8RGT-ED9P>].

⁴ Kelly Pickerel, Don't Eat Your O&M Costs- Leave it to Those with Four Legs, SOLAR POWER WORLD (Aug. 29, 2016), <https://www.solarpowerworldonline.com/2016/08/dont-eat-solar-om-costs-leave-four-legs/> [<https://perma.cc/9GY9-KKPC>].



Executive Summary

The aim of this policy guide is to centrally locate both state and local Illinois regulations that potentially carry implications for those wishing to establish agrivoltaic operations in the state. The first part of this guide briefly gives a history of agricultural and renewable energy development in Illinois, as well as details agrivoltaic research efforts by the University of Illinois.

The guide then covers local-level policies that will have bearing on agrivoltaic development attempted in Illinois counties. Beginning with an examination of the intent of various Illinois counties in enacting solar siting zoning policies, the guide provides helpful visualization of solar siting requirements by county. While the guide does not list all regulatory requirements imposed by each county, the guide enumerates some of the most vital to establishing an agrivoltaic operation. For further information about local requirements for solar siting, please see the attached appendix containing the references zoning ordinances. Similarly, an inclusive, though not exhaustive, list of definitions pertaining to solar siting and agricultural land use have been included to highlight the numerous regulatory approaches taken and potential conflicts.

The final portion of this policy guide discusses state-level policy in Illinois that may potentially impact agrivoltaic development in Illinois, especially in the instance of installing solar panel on agriculturally classified land. This section covers: (1) The Agricultural Areas Conservation & Protection Act; (2) The Sustainable Agriculture Act; The Renewable Energy Facilities Agricultural Impact Mitigation Act; and the Illinois Municipal Code. Brief discussions of the implications for agrivoltaics follows the discussion of each statute.

I

I. Background

Renewable Energy in Illinois

Illinois consumed 3,612.9 trillion Btu of energy in 2020 (the most recent tracking year with available data) making it the fifth highest energy consuming state in the U.S. Of this amount, 297.4 trillion Btu of energy consumed by Illinois in 2020 was renewable, roughly 8.2%; furthermore, only 5.7 trillion Btu, or 0.1% of Illinois' total energy consumption came from solar energy.⁵⁶ Notably, solar energy generation in Illinois is increasing rapidly. Figure 1 displays a map of all utility-scale solar energy facilities that were online in Illinois as of August 2021, the most recent version of the data. Figure 2 shows the amount of utility-scale solar energy generated in Illinois in 2021—a nearly 650% increase from 2020.

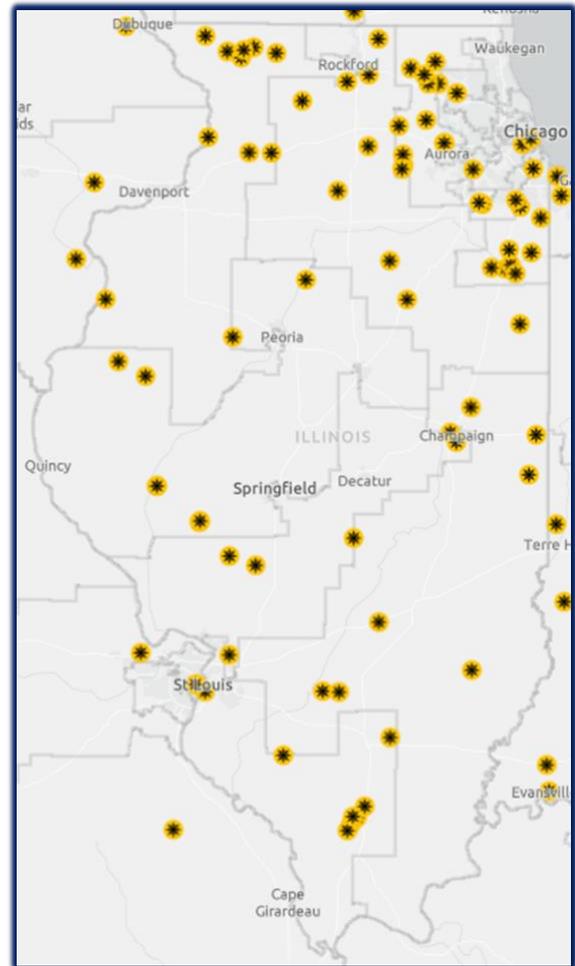


Figure 1: Utility-scale solar energy sites in Illinois (2021)⁷

⁵ Table C10. Total Energy Consumption Estimates, Real Gross Domestic Product, Energy Consumption Estimates per Real Dollar of GDP, Ranked by State, EIA.GOV (2020), https://www.eia.gov/state/seds/sep_sum/html/pdf/rank_use_gdp.pdf (last visited Dec 14, 2022).

⁶ Table C13. Renewable Energy Consumption Estimates by Source, Ranked by State, EIA.GOV (2020), https://www.eia.gov/state/seds/sep_sum/html/pdf/rank_use_renew.pdf (last visited Dec 14, 2022).

⁷ Solar Energy Infrastructure and Resources, EIA U.S. ENERGY ATLAS (2021), <https://atlas.eia.gov/apps/eia::solar/explore> (last visited Jan 1, 2023).

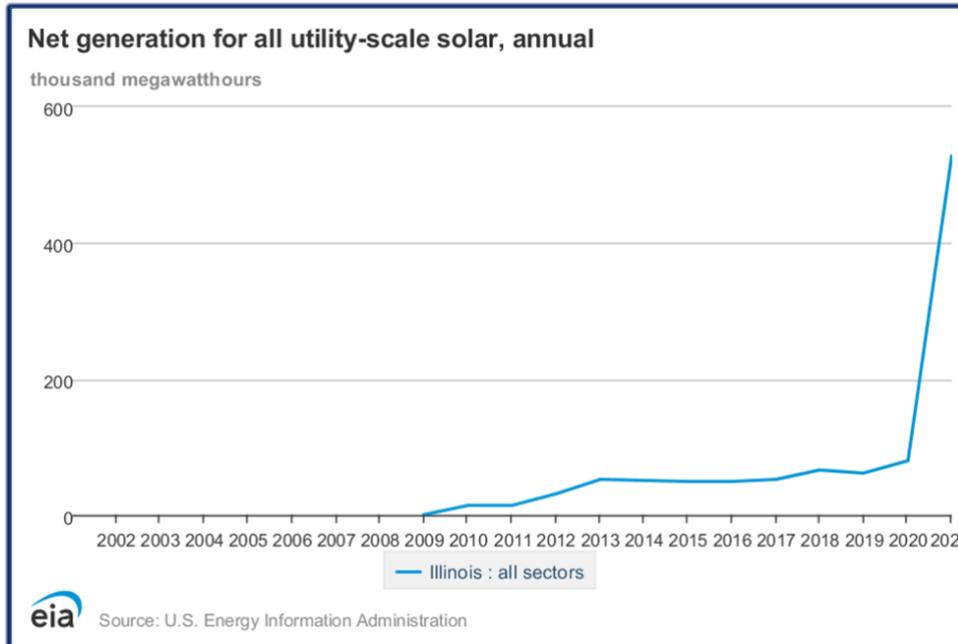


Figure 2: Annual net generation of utility-scale solar energy in Illinois (thousand megawatt-hours)⁹

In addition to the rapid increase in solar energy development, Illinois is subject to a renewable portfolio standard (RPS) that was strengthened with the passage of the Climate and Equitable Jobs Act in 2021. The Illinois RPS sets goals of 25% of the state’s renewable energy generation being renewable by 2025, increasing by 3% each year to a target of at least 40% by 2030, and a final established goal of 50% of energy coming from renewable sources by 2050.¹⁰ Solar energy plays a significant role in the Illinois RPS, as 10,000,000 renewable energy credits (RECs) were required to be supplied from new projects by the end of 2021 and of those 10,000,000 credits, a target of 55% is set to come from photovoltaic projects.¹¹ This yearly development target will increase to 45,000,000 RECs by the end of 2030 with the same ratio of credits coming from solar energy projects.¹²

⁹ U.S. Energy Information Administration (EIA) - Independent Statistics and Analysis, EAI.GOV (2022), <https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2.0,1&fuel=06&geo=g0fvvvvvvvvvo&sec=g&freq=M&start=200101&ctype=linechart<ype=pin&rtype=s&maptype=0&rse=0&pin=> (last visited Dec 14, 2022).

¹⁰ CLIMATE AND EQUITABLE JOBS ACT OF 2021, IL S.B. 2408, 102 ASSEMBLY § 1-75 (2021).

¹¹ *Id.*

¹² *Id.*



Illinois Agriculture

Illinois hosts roughly 70,000 farm operations managing a total of 27 million acres, about 75% of the state's total land area.¹³¹⁴ Corn and soybeans comprise the majority of the state's crop production, occupying 11 and 10.6 million acres, respectively.¹⁵ Hogs are the primary livestock animal raised in Illinois at 5.4 million.¹⁶ Altogether, Illinois' agricultural commodities generate over \$19 billion per year, with additional economic revenue flowing to agriculture-related industries.¹⁷

Following national trends, farmland in Illinois has declined over time. Figure 3 depicts Illinois land in farms from 1990 to 2021, showing that Illinois has lost 1,500,000 acres of agricultural land in 30 years.

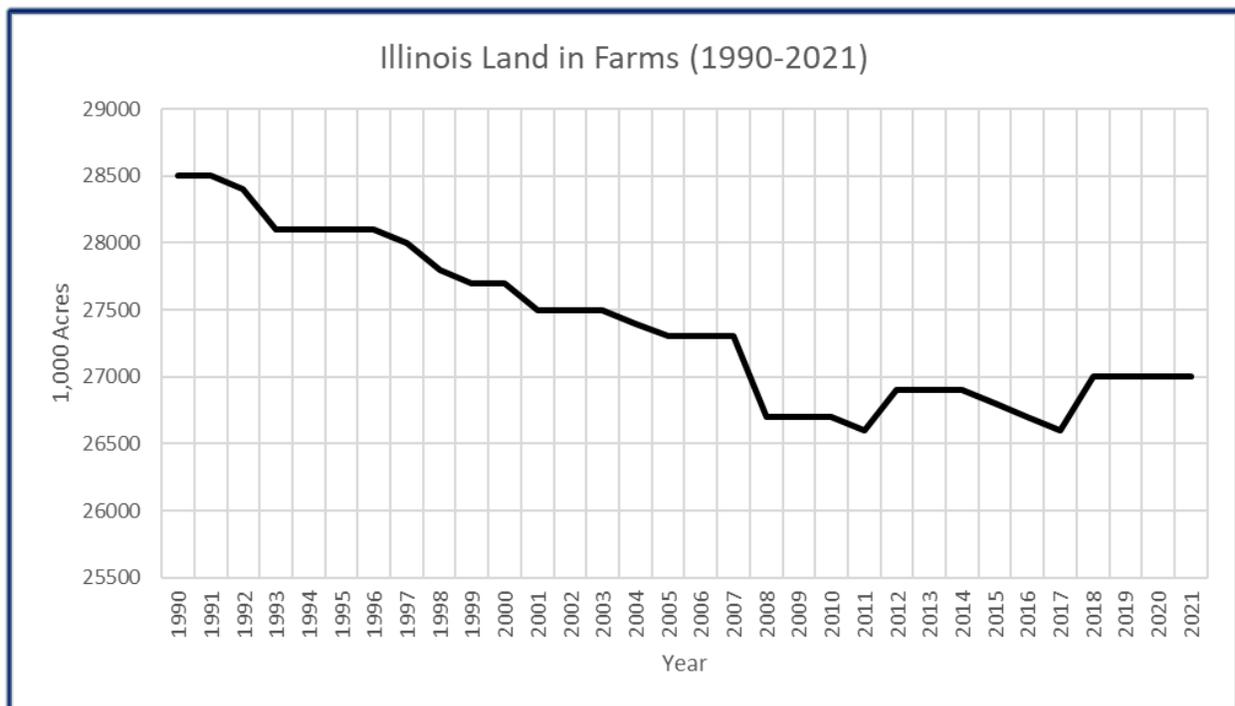


Figure 3: Illinois Land in Farms (1990 – 2021)¹⁸

¹³ 2021 State Agriculture Overview, USDA/NASS 2021 STATE AGRICULTURE OVERVIEW FOR ILLINOIS (2022), https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=ILLINOIS (last visited Dec 14, 2022).

¹⁴ Facts about Illinois Agriculture, ILLINOIS.GOV, <https://www2.illinois.gov/sites/agr/About/Pages/Facts-About-Illinois-Agriculture.aspx> (last visited Dec 14, 2022).

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ Chart generated from data found in U.S.D.A., Farms and Land in Farms, <https://usda.library.cornell.edu/concern/publications/5712m6524?locale=en> (Feb. 18, 2022) (information synthesized from dozens of reports on this page).



In an effort to preserve valuable agricultural land, Illinois passed the Agricultural Areas Conservation and Protection Act¹⁹ (AAPA) which allows for the creation of Agricultural Areas, tracts of land in which only agricultural production is allowed.²⁰ No studies have analyzed the impact of the AAPA, but since the first agricultural areas were established in 2000, the amount of protected agricultural land has increased from 118,000 acres to roughly 123,000 acres in 2021 for a variety of reasons.²¹ Protected agricultural lands may cause complications further in the development process when considering installation of renewable energy such as solar panels in efforts to establish agrivoltaic operations.

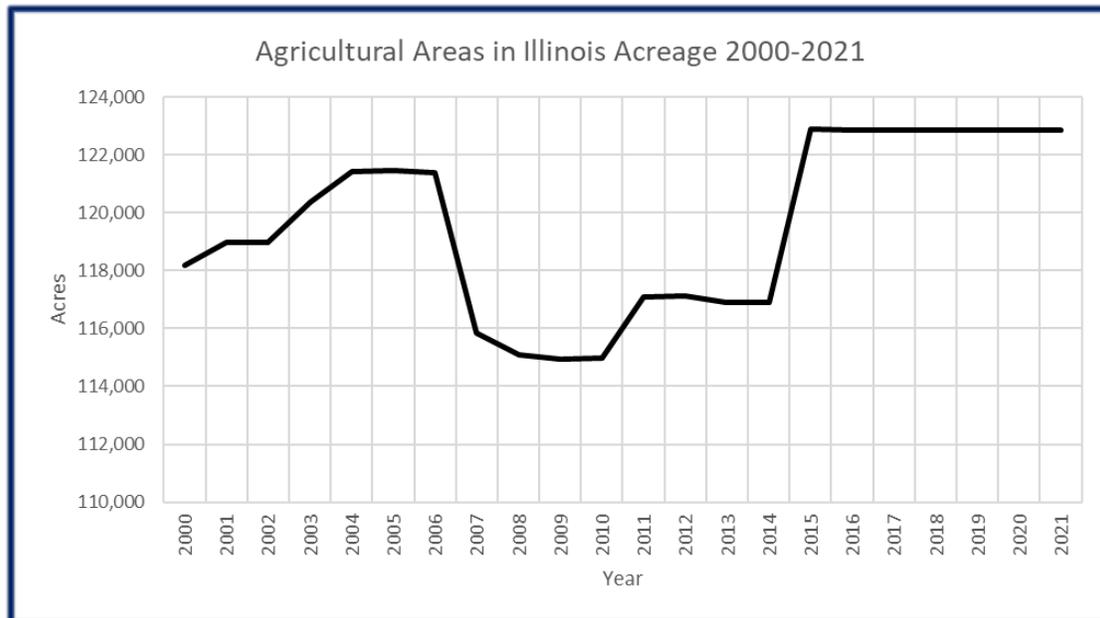


Figure 4: Agricultural Areas in Illinois Acreage (2000 – 2021)²²

Agrivoltaics Research Development in Illinois

Illinois, in coordination with several universities nationwide, is furthering agrivoltaics research through its academic institutions. The University of Illinois, Urbana-Champaign is a participant in the USDA-funded SCAPES (Sustainably Co-locating Agricultural and Photovoltaic Electricity Systems) Research to develop a greater understanding of agrivoltaics. The research team identifies four primary goals:

1. Coordinate the design of a suite of experimental agrivoltaic arrays and measurement systems across regions;

¹⁹ AGRICULTURAL AREAS CONSERVATION AND PROTECTION ACT, 505 ILCS 5/1, P.A. 81-1173 (2021).

²⁰ AGRICULTURAL AREAS CONSERVATION AND PROTECTION ACT, 505 ILCS 5/1, P.A. 81-1173 (2021).

²¹ Agricultural Areas Reports <https://www2.illinois.gov/sites/agr/Resources/FarmlandProtection/Pages/Agricultural-Areas-Reports.aspx> (2022) (information synthesized from dozens of reports on this page).

²² Chart generated from data found in Illinois Department of Agriculture Agricultural Areas Reports <https://www2.illinois.gov/sites/agr/Resources/FarmlandProtection/Pages/Agricultural-Areas-Reports.aspx> (2022) (information synthesized from dozens of reports on this page).



2. Determine crop and photovoltaic performance within an integrated agrivoltaic system;
3. Incorporate regional results into an integrated model that is capable of conducting structural, electrical, thermal, agricultural, water management, and economic outcomes;
4. Integrate stakeholder perceptions of agrivoltaic system design and share model outputs through open-source tools for informing planning and development.²³

The Illinois contribution to the SCAPES project includes determining the regional viability of agrivoltaic application in the Midwest and its associated crops,²⁴ as well as assessing the applied economics of adopting agrivoltaics.²⁵

²³ Research, SCAPES AGRIVOLTAICS PROJECT (2022), <https://scapes.illinois.edu/research/> (last visited Dec 14, 2022).

²⁴ *Id.*

²⁵ Madhu Khanna & Ruiqing Miao, *Inducing the adoption of emerging technologies for sustainable intensification of food and renewable energy production: Insights from Applied Economics**, 66 AUSTRALIAN JOURNAL OF AGRICULTURAL AND RESOURCE ECONOMICS 1–23 (2021).

II. Local-Level Policies

Zoning and land use determinations are inherently local, as land use is a reserved police power of the states. While state policies governing agricultural land use and renewable energy goals impose their own regulations on the nexus of renewable energy and agriculture, significant differences and/or additional requirements at the local level add another layer of regulatory complexity. Below is a map displaying the county-level policies implemented to regulate the installation of solar energy in Illinois. Many counties in Illinois currently have no solar siting ordinance on the books, but those counties that have enacted ordinances represent drastically varying approaches to zoning and land use policy.

A. Overview of Regulatory Requirements by County-Level Ordinances

A survey of ordinances enacted in Illinois counties to regulate the installation of solar demonstrate the variety of approaches to implementing a legal landscape at the nexus of renewable energy and agriculture. Purpose statements included at the outset of some county ordinances offer insight as to how various localities throughout Illinois view land use interactions between renewable energy and agricultural uses.

- “The purpose of this ordinance is to *preserve and protect public health and safety without significantly increasing the cost or decreasing the efficiency of a solar energy facility* and to allow for the orderly development of land, protect property values and aesthetic conditions within the county.”²⁶ – Christian County, Illinois

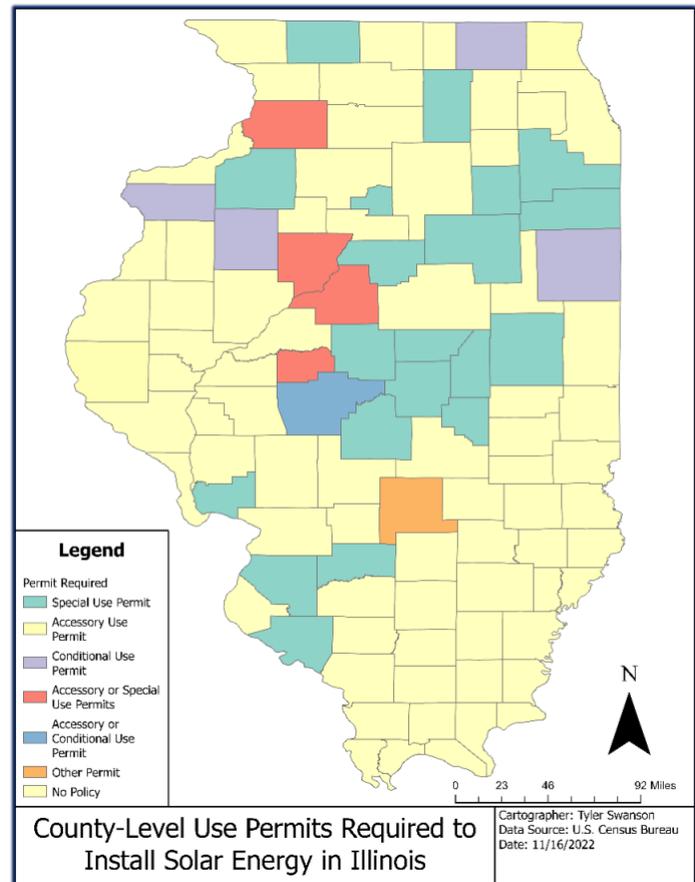


Figure 5: Use Permits Required for Solar Energy Installations

- “The purpose of this ordinance is *to promote and encourage economic development, while maintaining order in the construction, installation, and operation of Solar Energy Systems (SES) in DeKalb County . . . Also, to avoid adverse impact to important areas such as agricultural land, endangered species habitats, conservation land, and other sensitive lands.*”²⁷ – DeKalb County, Illinois

²⁶ Christian County Zoning, Ordinance #O2017ZN012 (2017).

²⁷ County of DeKalb, Ordinance 2018-06, An Ordinance Adopting A Solar Energy System Ordinance for DeKalb County (2018).

I

- “The purpose of these regulations is to *provide a uniform and comprehensive set of standards for the installation and use of SFEs designed for commercial energy production*. The intent of these regulations is to *protect the public health, safety, and community welfare while allowing development of solar energy resources for commercial purposes*.”²⁸ – Henry County, Illinois
- “1. To assure that any *development and production of solar generated electricity* in all Iroquois County is *safe and effective*; 2. To assure the *protection of health, safety, welfare, and property values* for all Iroquois County residents and land owners; 3. To *facilitate economic opportunities for local residents*; and 4. To *promote the supply of solar energy* in support of Illinois Statutory foal of increasing energy production from renewable energy sources.”²⁹ – Iroquois County, Illinois
- It is the purpose of this ordinance to regulate the siting and installation of ground mounted solar energy equipment. *The promotion of safe, effective, and efficient use of ground mounted solar energy equipment will be balanced against the need to preserve and protect public health and safety*.”³⁰ – Peoria County, Illinois
- “to provide a *uniform and comprehensive set of standards for the installation and use of PSEs designed for on-site home, farm, and small commercial use that are used primarily to reduce on-site consumption of utility power*.”³¹ – Sangamon County, Illinois
- “to encourage the *orderly development of solar energy systems without the need for unduly burdensome procedures*.”³² – City of Freeport, Stephenson County, Illinois

Notably, while some counties meticulously describe plentiful application types, fees, compliance certificates, and other requirements that duly demonstrate one’s capacity to engage in solar development, other counties require very little by statute to initiate development of a solar facility on agricultural land. In other instances, some counties have passed temporary moratoriums on applications for solar farms, like Putnam.³³ While not inclusive of all requirements stated in county ordinances, the below graph provides a visualization of standard special use application requirements across Illinois counties.

²⁸ Henry County Zoning Ordinance for the Unincorporated Areas of Henry County, Illinois, Appendix C Solar Energy Ordinance (2018).

²⁹ Iroquois County Solar Energy Ordinance (2017), amended (2019).

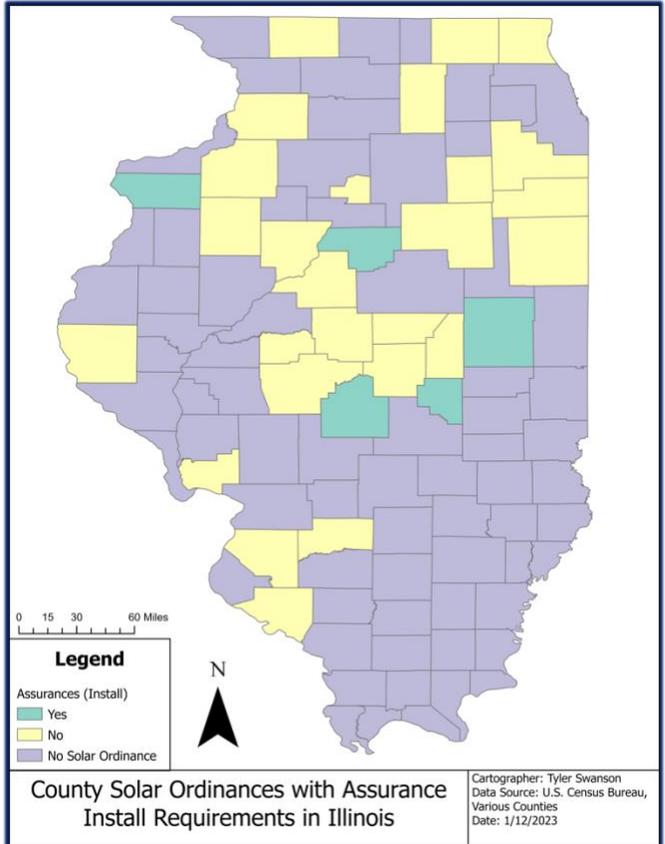
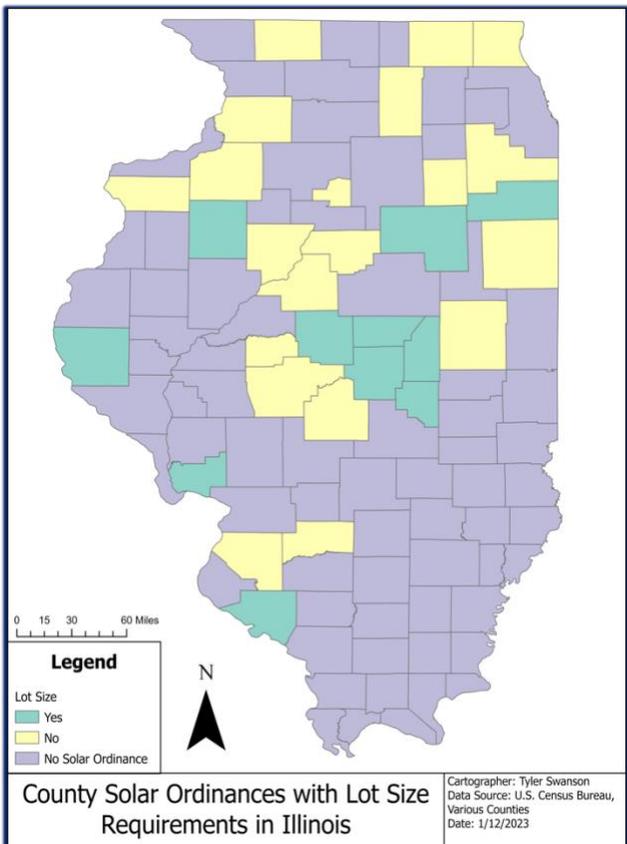
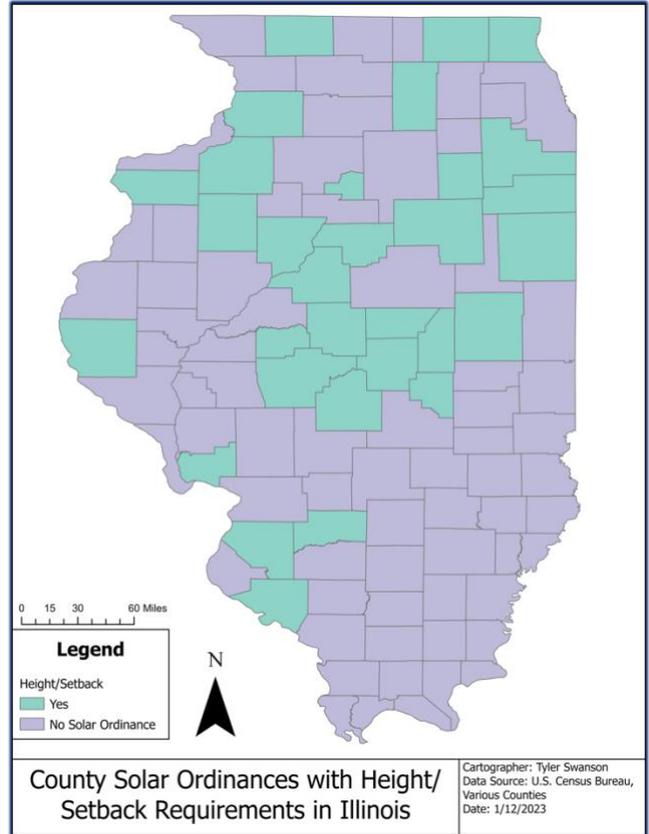
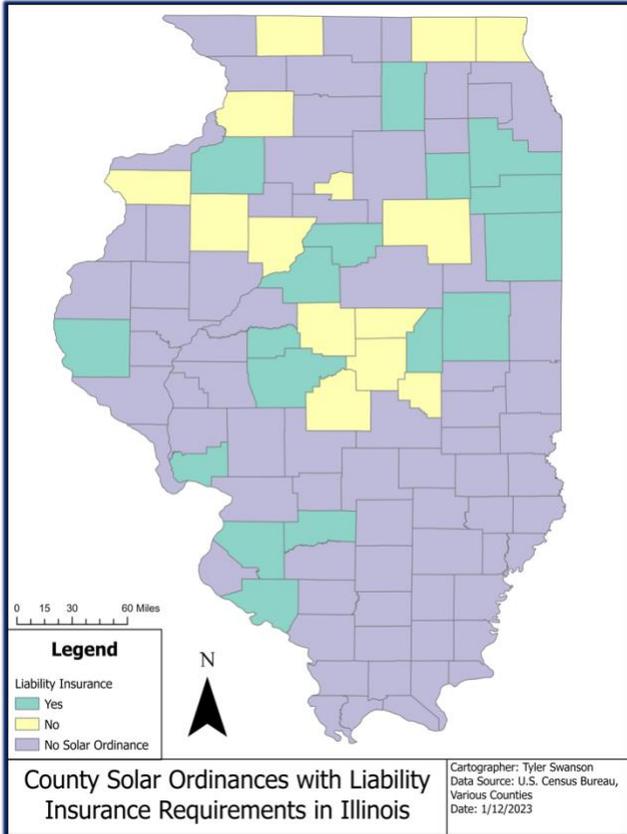
³⁰ Peoria County Zoning Ordinance 7.17 Ground Mounted Solar Energy Systems (2018).

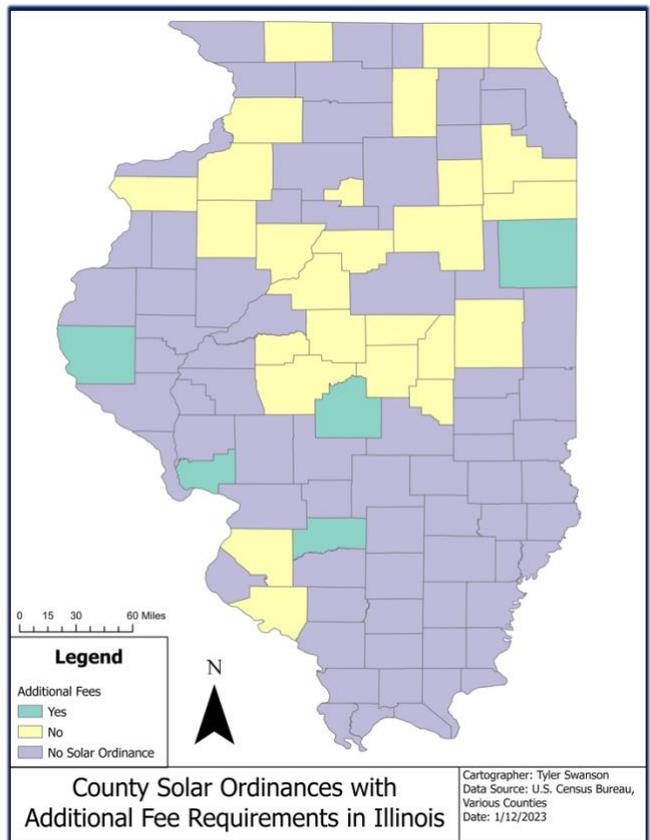
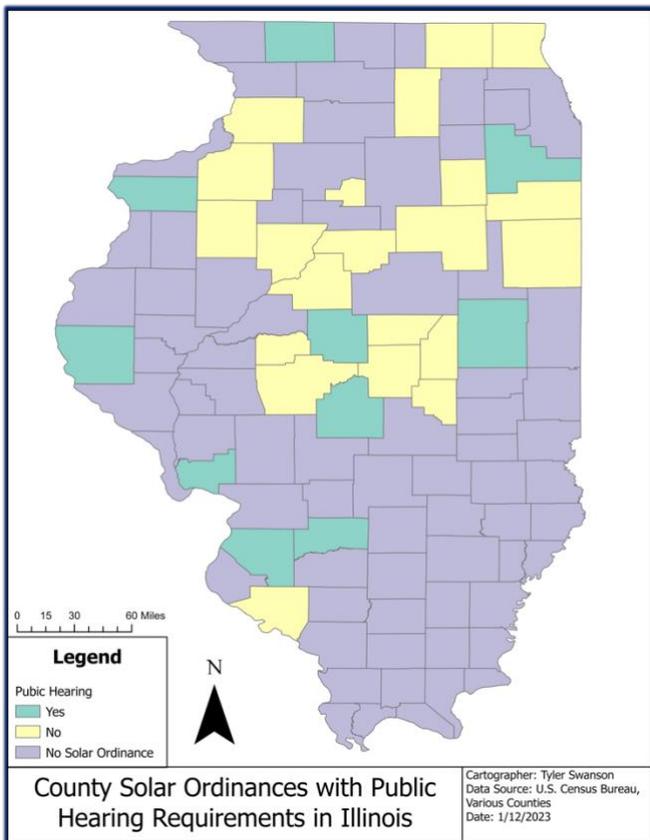
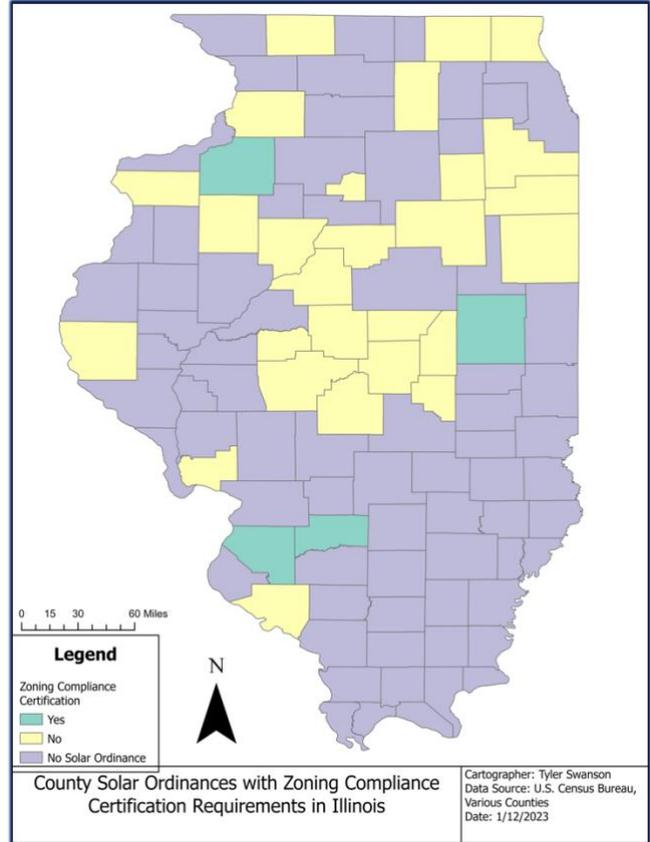
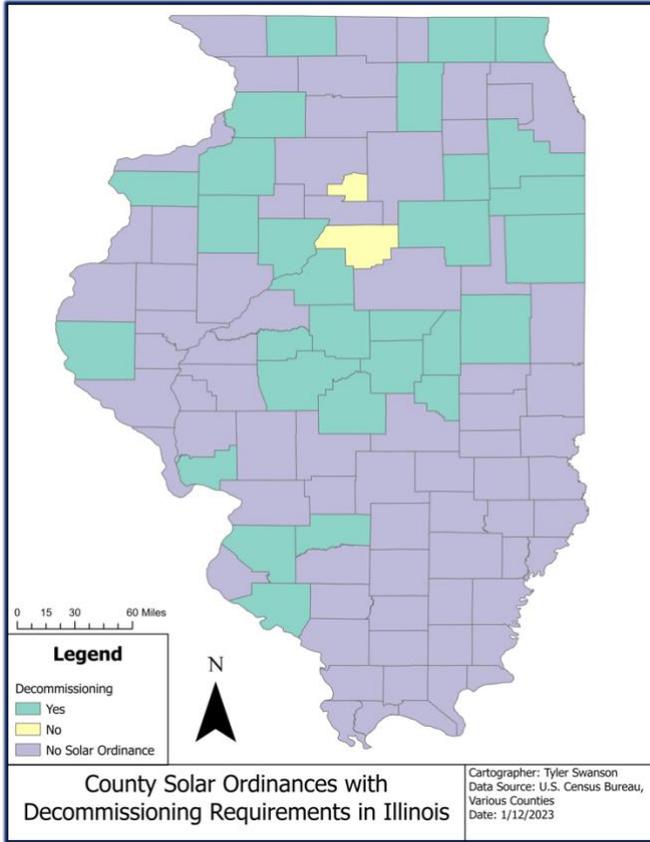
³¹ Text Amendment to Sangamon County Zoning Ordinance Regarding Chapter 17.37 Solar Energy Systems (2018).

³² An Ordinance Amending the Codified Ordinances of the City of Freeport Regarding the Regulation and Zoning of Solar Energy Systems, Ordianance No. 2018-40 (2018).

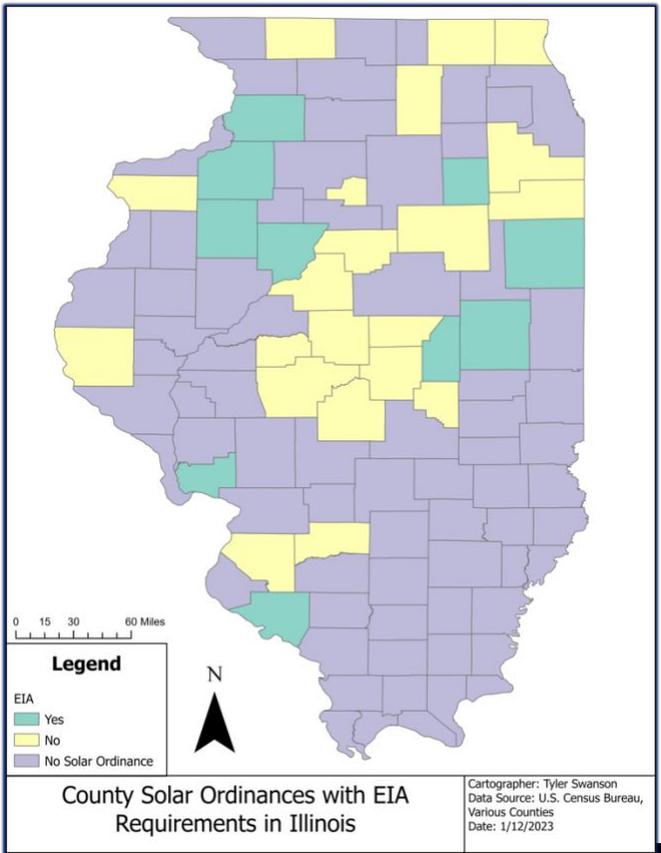
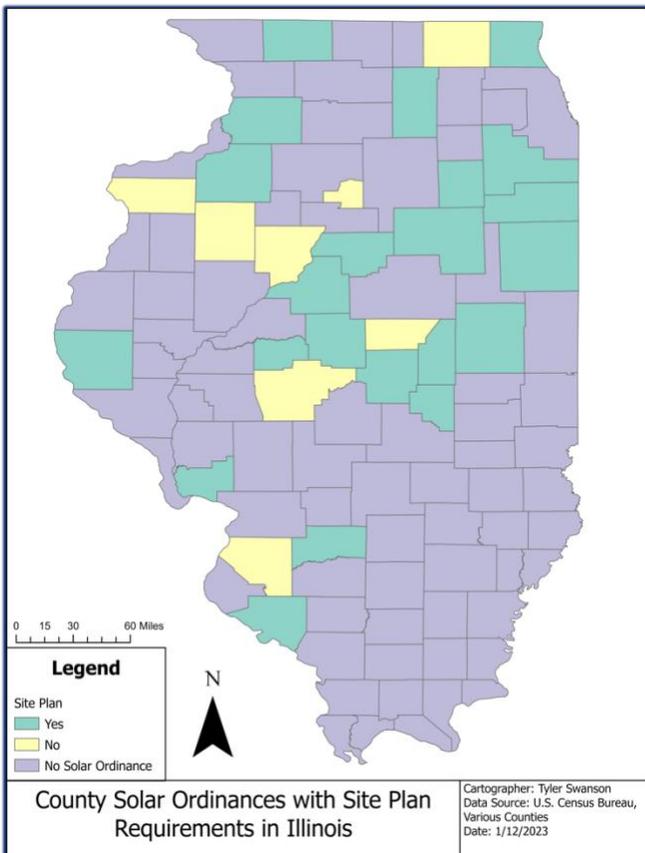
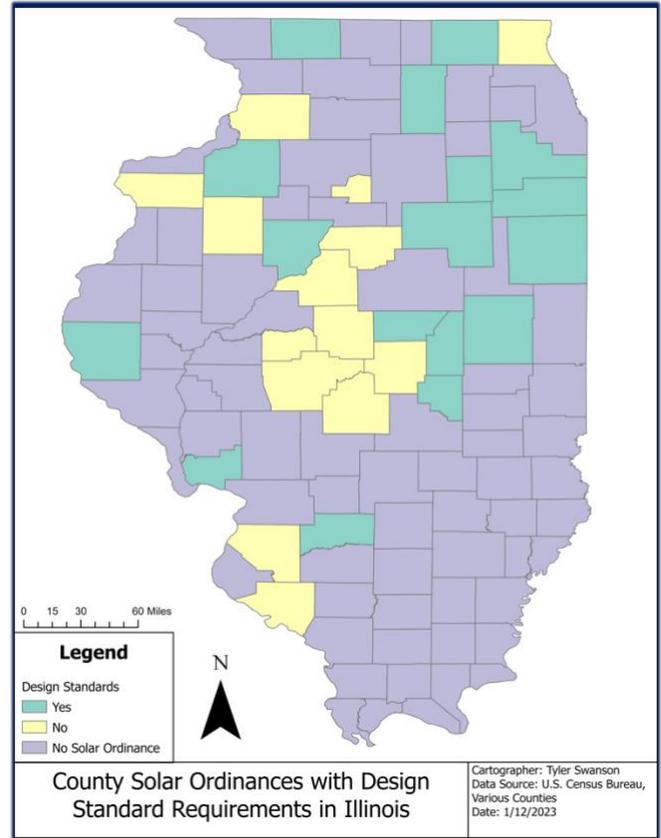
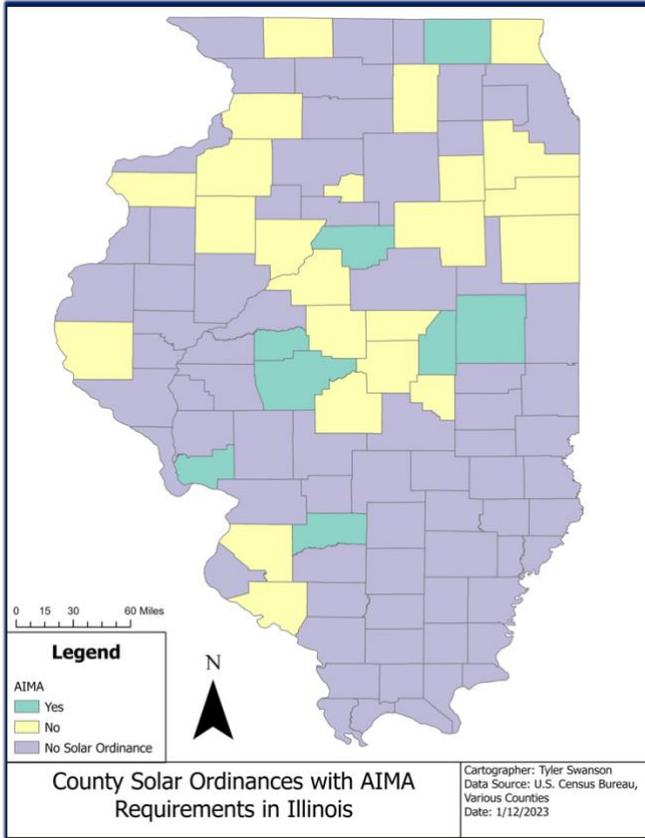
³³ Resolution Extending the Temporary Moratorium on Solar Farm Applications, Putnum County Board Resolution 2022-16 (Dec.12, 2022), <https://putnamil.gov/county-offices/document-library/ordinances-resolutions/372-resolution-2022-16-extending-the-moratorium-on-solar/file>.

I

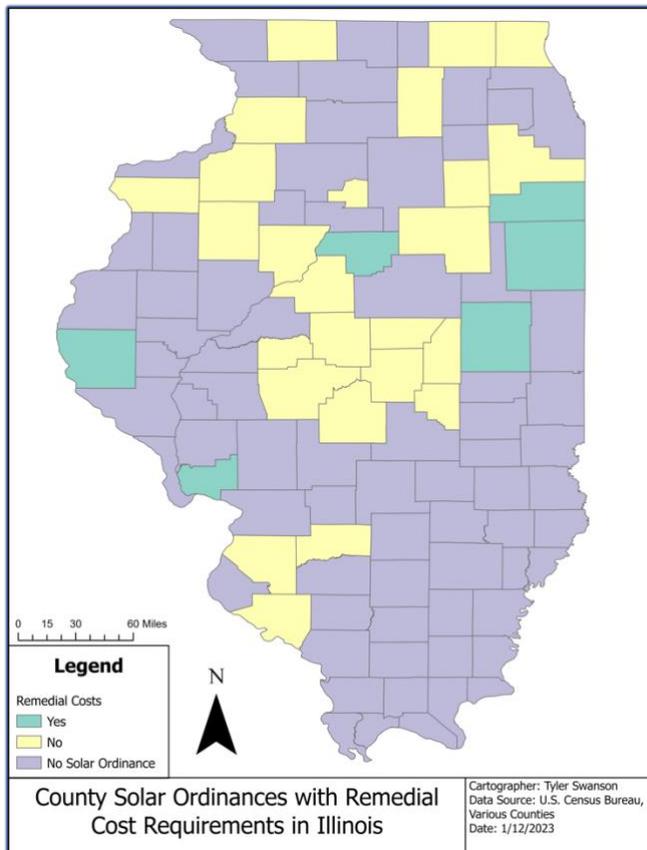
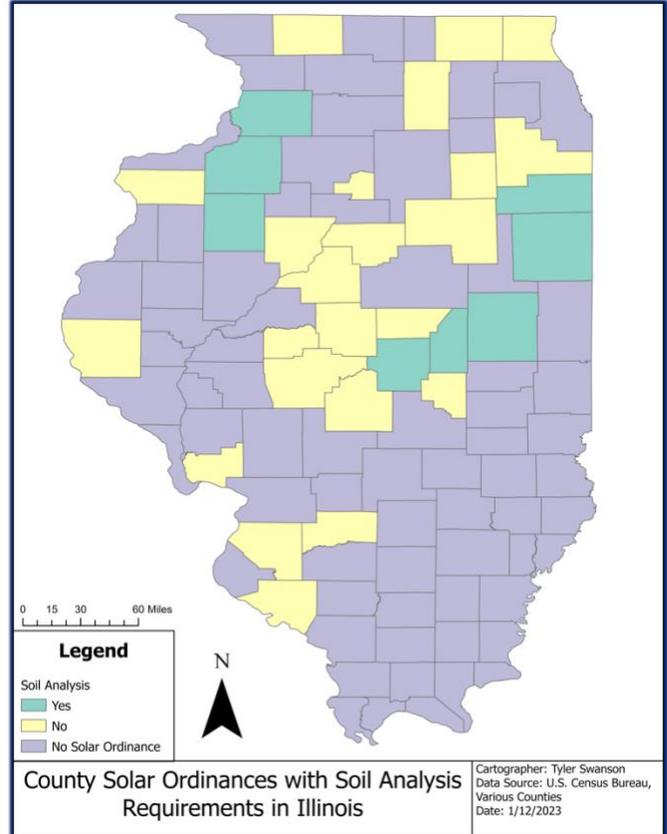
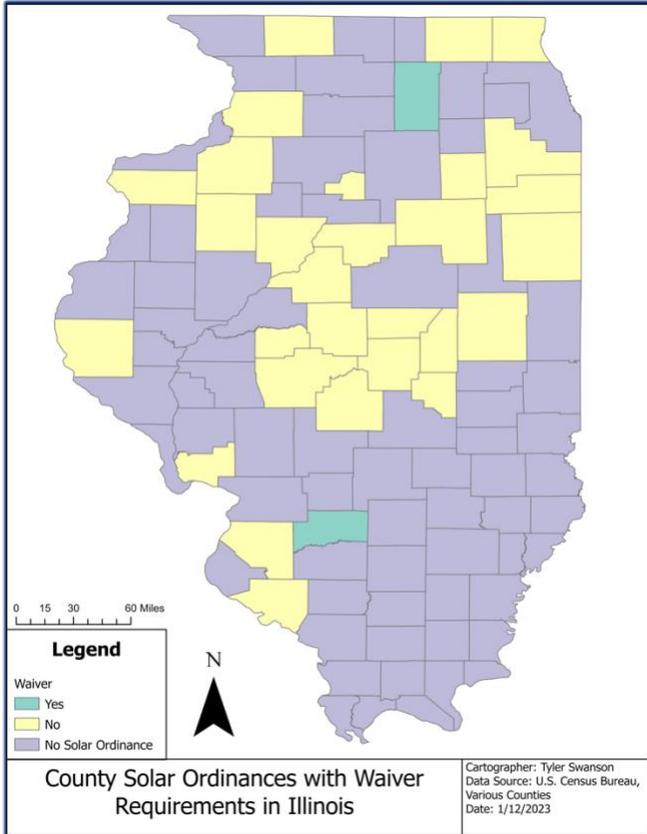




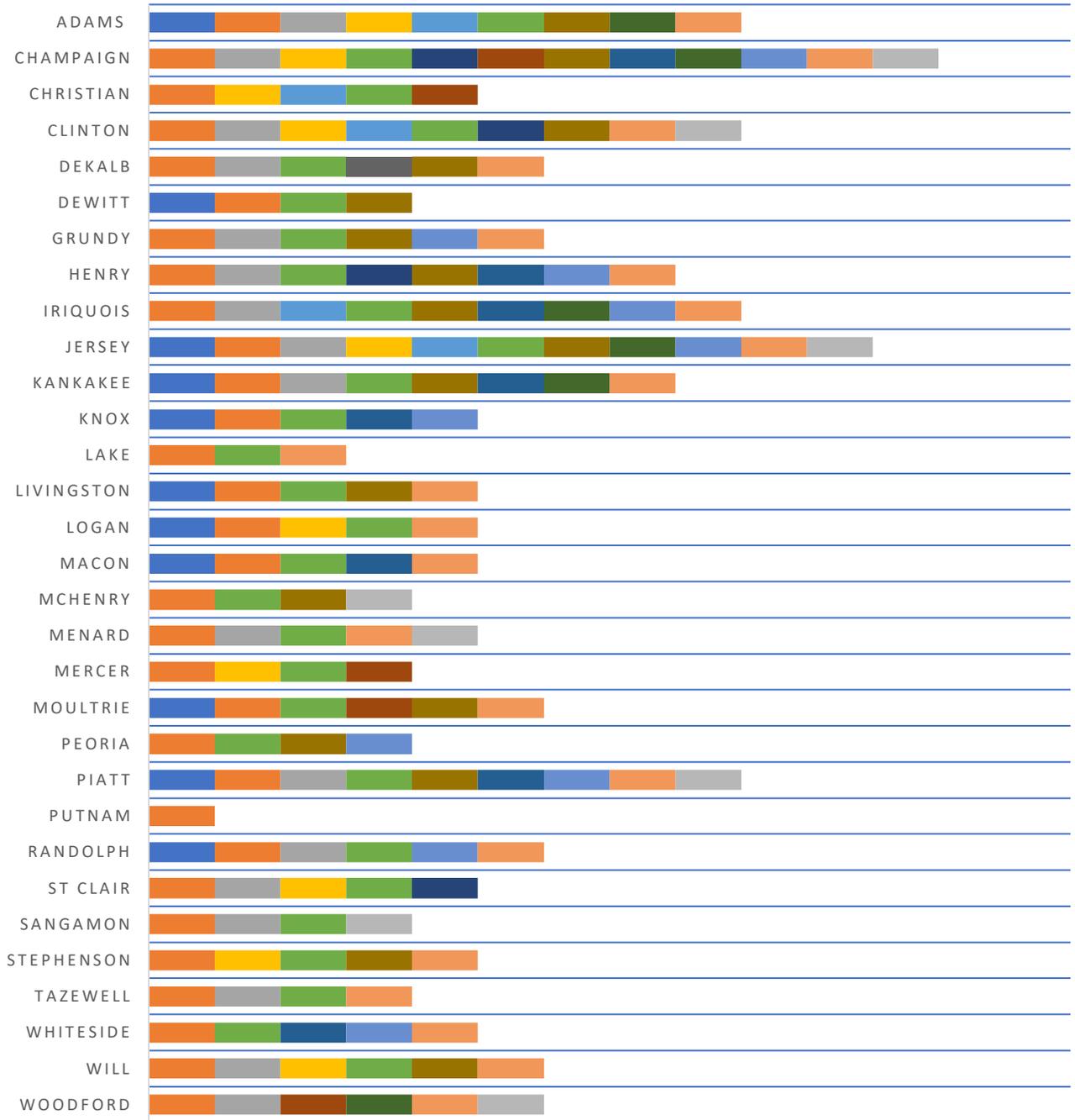
I



I



I



- Lot Size
- Height/Setback
- Liability Insurance
- Public Hearing
- Additional Fees*
- Decommissioning
- Zoning Compliance Cert.
- Assurances (Install)
- Waiver
- Design Standards
- Soil Analysis
- Remedial Costs
- EIA
- Site Plan
- AIMA



B. Local-Level Solar Definitions

Below is collection of definitions relevant to siting solar energy systems in Illinois. Please note the many terms that vary in definition according to county as well as the counties with identical terminology. Attention to detail is imperative to determining how your planned solar installation will be defined and regulated within a particular county. Also note where solar energy systems are required to be the primary land use on the lot.

Commercial Solar Energy Systems

Term	Definition	Counties Using Definition
Commercial Grade	A solar system that is harvesting solar energy for the purpose of providing power to two or more homes and does not apply to solar energy systems that are installed for the purpose of powering a single residential home.	Fayette
Commercial/Large Scale Solar Farm (SES)	Ground Mount solar energy systems that are primary use of the lot, designed for providing energy to off-site uses or export to the wholesale market.	DeWitt
	A utility scale commercial facility that converts sunlight to electricity, whether by photovoltaics, concentrating solar thermal devices, or various experimental technologies for onsite or offsite use with the primary purpose of selling wholesale or retail generated electricity.	Menard, Randolph
Commercial/Large Scale Solar Farm	A utility scale commercial facility that converts sunlight to electricity, whether by photovoltaics, concentrating solar thermal devices, or various experimental technologies for onsite or offsite use with the primary purpose of selling wholesale or retail generated electricity. A COMMERCIAL SOLAR FARM is the principal land use for the parcel on which it is located.	Tazewell
Solar Energy Systems, Commercial	Any device or combination of devices or elements which rely on power obtained by harnessing the energy of the sun’s rays. intended primarily to be sold to wholesale or retail markets	Piatt
Solar Energy System, Utility	A solar energy system that is used in order to produce energy for commercial distribution.	Putnam
	A commercial Facility that converts sunlight into electricity, whether by photovoltaics (PV) concentrating solar thermal devices (CST), or other conversion technology, for the primary purpose of wholesale sales of generated	Adams, DeKalb, Whiteside

I

	electricity. A solar farm is the principal land use for the parcel on which it is located.	
	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. A solar farm is the principal land use for the parcel on which it is located. Utility scale solar must be bigger than 2 MW AC.	Jersey
	A commercial facility that converts sunlight into electricity for the primary purpose of wholesale sales of generated electricity. A solar farm is the principal land use for the parcel on which it is located.	Knox
	A solar panel or array composed of multiple solar panels on ground-mounted rack or poles which are one of the primary use(s) for the parcel of land on which it is located, or any solar energy system that has a primary purpose for wholesale or retail sales of generated electricity.	Livingston
	A commercial facility, on a parcel(s) of five acres or more that converts sunlight to electricity, whether by photovoltaics, concentrating solar thermal devices, or various experimental technologies for on-site or off-site use with the primary purpose of selling wholesale or retail generated electricity.	St. Clair
Solar Farm Energy System	A utility scale facility that converts sunlight into electricity for the primary purpose of selling wholesale or retail generated electricity for on-site and off-site use. A solar farm is the principal land use for the parcel on which it is located. Included within this definition of a Solar Farm Energy System are any things defined or described in 35 ILCS 200/10-720 as a “Commercial Solar Energy System”, as same may be amended from time to time, which statute is incorporated herein by reference as though fully set forth herein. (Ord. No. 2018-36; 12-17-18)	Clinton
	A commercial facility, on a parcel(s) of five (5) acres or more that converts sunlight to electricity, whether by photovoltaics, concentrating solar thermal devices, or various experimental technologies for on-site or off-site use with the primary purpose of selling wholesale or retail generated electricity.	Henry, Sangamon
Solar Farm Energy System (SFES)	A commercial facility that converts sunlight to electricity, whether by photovoltaics, concentrating solar thermal devices, or various experimental technologies	Woodford

I

Solar Garden	A commercial solar-electric (photovoltaic) array, of no more than 20 acres in size, that provides retail electric power (or a financial proxy for retail power) to multiple households or businesses residing in or located off-site from the location of the solar energy system. A county solar garden may be either an accessory use, when a part of an existing or a proposed subdivision or a special use if it is a stand-alone garden.	DeKalb, Whiteside
	A commercial solar-electric array, of no more than 5 acres in size that provides retail electric power to multiple households or businesses residing in or located off-site from the location of the solar energy system. A solar garden may be either an accessory use or a special use if it is a stand-alone garden.	Henry
	A commercial solar-electric (photovoltaic) array that provides retail electric power (or financial proxy for retail power) to multiple households or businesses residing or located off-site from the location of the solar energy system. A community solar system may be either an accessory or a principal use.	Jersey
	A commercial solar-electric array, of no more than 5 acres in size that provides retail electric power to multiple households or businesses residing in or located off-site from the location of the solar energy system.	Knox

Community Solar Energy Systems

Term	Definition	Counties Using Definition
Collective Solar	Solar installations owned collectively through subdivision homeowner associations, college student groups, or other similar arrangements.	Randolph, Tazewell
Community Solar	A solar electric system that provides power and or financial benefit to, or is owned by, multiple community members where solar generation is on roof tops and under 2 Megawatt alternating current (AC).	Iroquois
Community Solar Garden	A community solar-electric (photovoltaic) array, or no more than 5 acres in size, that provides retail electric power (or financial proxy for retail power) to multiple households or businesses residing in or located off-site from the location of the solar energy system.	Randolph
	A community solar-electric (photovoltaic) array, that provides retail electric power (or financial proxy for retail power) to multiple households or businesses	Tazewell



	residing in or located off-site from the location of the solar energy system. A community solar system may be either an accessory or principal use.	
PV Solar Farm, Community	A PV SOLAR FARM of not more than 2,000 kilowatt nameplate capacity that meets the requirements of 20 ILCS 3855/1-10 for a “community renewable generation project” and provided that two COMMUNITY PV SOLAR FARMS may be co-located on the same or contiguous parcels as either: a) two 2-MW projects on one parcel, or b) one 2-MW project on each of two contiguous parcels, as authorized by the Illinois Commerce Commission in Final Order 17-0838 on April 3, 2018.	Champaign

Personal Solar Energy Systems

Term	Definition	Counties Using Definition
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.	DeKalb, Jersey, Whiteside
Off-Grid Systems	A system is considered an off-grid system only if it supplies electrical power solely for on-site use.	Will
Personal Solar Energy System	"Any device or combination of devices or elements which rely upon directly sunlight as an energy source including but not limited to any substance or device which collects sunlight for generating electricity for use on-site. However, the energy output may be delivered to a power grid to offset the cost of energy on-site. Included within this definition of Personal Solar Energy System are any things defined or described in 35 ILCS 200/10-5(d), as same may be amended from time to time, which statute is incorporated herein by reference as though fully set forth herein. (Ord. No. 2018-36; 12-17-18)	Clinton
Solar Energy System, Private	A collection of one (1) or more solar collectors designed for use by the occupant(s) of the zoning lot on which said system is located; excess power generation is limited to net metering or similar technology with regulations set by the local power utility, community, county, and state. Private solar energy system equipment shall conform to applicable industry standards, and applicants for building permits for private solar energy systems shall	DeKalb

I

	submit certificates from equipment manufacturers that the equipment is manufactured in compliance with industry standards.	
	Any device or combination of devices or elements which rely upon directly sunlight as an energy source including but not limited to any substance or device which collects sunlight for generating electricity for use on-site. However, the energy output may be delivered to a power grid to offset the cost of energy on-site.	Henry, Sangamon, St. Clair, Woodford
Solar Energy Systems, Private	Any device or combination of devices or elements which rely on power obtained by harnessing the energy of the sun's rays, intended primarily to be used as an onsite power source, however, incidental energy output may be delivered to a power grid to offset the cost of energy on site.	Piatt
Private Solar	A solar electric system that is owned by homeowner or tenant to provide solar electricity for the residence or net metering. This ordinance does not apply to private residential solar systems. Private solar shall be deemed accessory or permitted use.	Iroquois

Solar Farms, Solar Energy Systems, And Their Scales

Term	Definition	Counties Using Definition
Active Solar Energy System	A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.	DeKalb, Jersey, Whiteside
Grid-intertie Solar energy system	A photovoltaic solar energy system that is connected to an electric circuit served by an electric utility company.	DeKalb, Jersey*, Whiteside
PV Solar Farm	A unified development intended to convert sunlight to electricity by photovoltaic (PV) devices for the primary purpose of wholesale sales of generated electricity. A PV SOLAR FARM is under a common ownership and operating control even though parts of the PV SOLAR FARM may be located on land leased from different owners. A PV SOLAR FARM includes all necessary components including access driveways, solar devices, electrical	Champaign

I

	inverter(s), electrical transformer(s), cabling, a common switching station, maintenance and management facilities, and waterwells. PV SOLAR FARM should be understood to include COMMUNITY PV SOLAR FARM unless specified otherwise in the relevant section or paragraph.	
Solar Energy Facility	An energy facility, an area of land, or a structural rooftop principally used to convert solar energy to electricity, which includes, but is not limited to, the use of one or more solar energy systems. This definition shall only include those facilities that sell electricity to be used ff site. Also with a lot size no smaller than 5 acres.	Christian
	An energy facility, an area of land, or a structural rooftop principally used to convert solar energy to electricity, which includes, but is not limited to, the use of one or more solar energy systems. This definition shall only include those facilities that sell electricity to be used off site.	Mercer
Solar Energy System (SES)	All components required to become a complete assembly or structure that will convert solar energy into electricity for use.	Clinton, DeKalb, Knox
	The components and subsystems required to convert solar energy into electric or thermal energy suitable for use. The area of the system includes all the land inside the perimeter of the system, which extends to any fencing.	Henry, Sangamon, St. Clair, Woodford
	As used in this section, a Solar Energy System (“SES”), also known as a solar power, solar park, solar field, and a solar farm, means an alternative energy facility that consists of one or more ground mounted or free-standing solar collection devices, solar energy related equipment, and other associated infrastructure with the primary intention of generating electricity or otherwise converting solar energy to a different form of energy for primarily commercial or other off-site use.	Jersey
	A device or structural design feature to provide for the collection, storage, and distribution of solar energy for space heating or cooling, electricity generation, or water heating.	Lake
	The components and subsystems required to convert solar energy into electric or thermal energy suitable for use. The area of the system includes all the land inside the perimeter of the system, which extends to any fencing. The term applies, but is not limited to, solar photovoltaic systems, solar thermal systems, and solar hot water systems.	Menard, Randolph, Tazewell

I

	A system which provides for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating through the use of photovoltaic panels or film or solar thermal panels, and includes all associated control, monitoring, and conversion electronics such as power inverters and battery storage units.	Stephenson
	A system for which the primary purpose is to convert solar energy into thermal, mechanical or electrical energy for storage or use.	Putnam
	A device, array of devices, or structural design feature, the purpose of which is to provide for generation of electricity, the collection, storage and distribution of solar energy for space heating or cooling, daylight for interior lighting, or water heating.	Whiteside
	A system intended to convert solar energy into thermal, mechanical or electrical energy.	Will
Large Scale Solar Energy System	Energy generated from multiple solar panels over a large parcel in which this would be the primary land use. Poles and racks of multiple solar panels would be used that would generate direct current (DC) rated capacity.	Henry
Solar Energy System, Large-Scale	A ground-mounted solar energy system that occupies at least 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).	Lake
Solar Energy System – Large Scale	A Solar Energy System with PV Arrays occupying more than one (1) acre of land and/or rooftop space.	Stephenson
Solar Energy System – Mid Scale	A Solar Energy System with PV Arrays occupying more than 4,000 square feet of land and/or rooftop space, but less than one (1) acre.	Stephenson
Solar Energy System, Medium-Scale	A ground-mounted solar energy system that occupies more than 1,750 square feet but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 to 250 kW DC).	Lake
Solar Energy System, Small-Scale	A ground-mounted solar energy system that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).	Lake
Solar Energy System- Small Scale	A Solar Energy System with PV Arrays occupying less 4,000 square feet of land and/or rooftop space	Stephenson



Relevant Zoning Structure and Use Types

Term	Definition	Counties Using Definition
Accessory	As applied to a building, structure, or use, one which is on the same lot with, incidental to, and subordinate to the main or principal structure or use and which is used for.	Menard, Randolph, Tazewell
Accessory Building	A subordinate building, the use of which is incidental to and customary in connection with the principal building or use and which is located on the same lot with such principal building or use.	Piatt
Accessory Structure	A structure on the same lot within the main or principal structure, or the main or principal use, either detached from or attached to the main or principal structure, subordinate to and used for purposes customarily incidental to main or principal structure or the main or principal use.	Champaign
	A structure that customarily is subordinate to and services a principal building or a principal use legally existing on the same zoning lot; is subordinate in area, extent, and purpose to the principal building or principal use; contributes to the comfort, convenience or necessity of the occupants, business, or industry of the principal structure or principal use served; and is located on the same zoning lot as the principal structure or principal use served.	Lake
Accessory Use	A USE on the same LOT customarily incidental and subordinate to the main or principal USE or MAIN or PRINCIPAL STRUCTURE.	Champaign
	A subordinate use which is incidental to and customary in connection with the principal building or use and which is located on the same lot with such principal building or use.	Piatt
	An "accessory use" includes, but is not limited to, the following: Carports; Public utility facilities, such as telephone, electric, gas, water and sewer lines, their supports and incidental equipment; and Solar Canopies.	Stephenson
Accessory Use or Structure	A use or structure customarily incidental and subordinate to the principal use or building and located on the same lot with such principal use or building.	Putnam
Use, Accessory	A use that customarily:	Lake

I

	<ul style="list-style-type: none">(1) Is subordinate to and services a principal building or a principal use legally existing on the same zoning lot;(2) Is subordinate in area, extent, and purpose to the principal building or principal use;(3) Contributes to the comfort, convenience, or necessity of the occupants, business, or industry of the principal structure or principal use served; and(4) Is located on the same zoning lot as the principal structure or principal use served.	
Special Use	A use allowed in a zoning district after a permit is granted by the Board of Appeals according to provisions of ARTICLE IV.	Piatt



Legal Definitions for Solar Energy Systems

Term	Definition	Counties Using Definition
Decommissioning Plan	A document that details the planned shutdown or removal of a solar energy facility from operation or usage.	Mercer
Net Metering	A billing arrangement that allows solar customers to get credit for excess electricity that they generate and deliver back to the grid so that they only pay for their net electricity usage at the end of the month.	Clinton, Randolph, Henry, Menard, Sangamon, St. Clair, Tazewell, Woodford
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.	DeKalb, Jersey, Whiteside
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.	DeKalb, Menard, Randolph, Tazewell, Whiteside
Solar Energy	Radiant Energy received from the sun that can be collected in the form of heat or light by a solar collector.	Clinton, Dekalb, Henry, Knox, Menard, Randolph, Sangamon, St. Clair, Tazewell, Whiteside, Woodford
Solar Farm Energy System Project Area	A SFES project area may be compromised of a single parcel of land or two (2) or more contiguous parcels of land providing that the total area of SFES project area consists of five (5) acres of land or more.	Henry
Solar Farm Energy System Project Area Solar Resource	A single parcel of land greater than five (5) acres, or two (2) or more contiguous parcels of land totaling a minimum of five (5) acres on which a SFES will be constructed and operated.	Sangamon
	An SFES project area may be comprised of a single parcel of land or two or more contiguous parcels of land providing that the total area of an SFES project area consists of five acres of land or more.	St. Clair
	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.	Whiteside



III. State-Level Policies

While most land use decisions are ultimately determined by local government authorities, state policy frames and forms the backdrop of agriculture and renewable energy in Illinois. The Illinois legislature has enacted several state-level policies that may have a bearing on the development of agrivoltaic installations. These policies relate to the creation of specific “Agricultural Areas” which heavily restrict the activities allowed on specific tracts of land, the allocation of funding to established “Sustainable Agriculture” research projects, the land stewardship requirements of solar developers, and the delegation to local authorities of the powers to regulate “special uses” of land and other responsibilities related to solar energy development. It is crucial to recognize the importance of local policy in regulating the development of solar energy, as local authorities maintain the ability to regulate land use within their jurisdiction, which has a significant impact on where solar energy installations can be developed, and what processes must be undertaken prior to constructing an installation.

A. The Agricultural Areas Conservation & Protection Act (AACPA)

The AACPA³⁴ was created to ensure a means to preserve land for agricultural use and protect against pressure from expanding urban areas. The act functions by allowing any landowner to apply to their county board for the creation of “Agricultural Areas” ranging in size from at least 100 acres in counties with a population of at least 600,000 people to at least 350 acres in counties with populations under 600,000. Once an application for an agricultural area is approved, the land retains the agricultural area designation for 10 years before the status is subject to review. Importantly, land in an agricultural area may only be used for “agricultural production” meaning:

“the production for commercial purposes of crops, livestock and livestock and aquatic products, but not land or portions thereof used for processing of such crops, livestock or livestock or aquatic products.”³⁵

The act further enumerates the definition of “Crops, livestock and livestock and aquatic products” as including but not limited to:

“legume, hay, grain, fruit, and truck or vegetable crops, floriculture, horticulture, mushroom growing, nurseries, orchards, forestry, greenhouses and aquatic products, including any aquatic plants and animals or their by-products that are produced, grown, managed, harvested and marketed on an annual, semi-annual, biennial or short-term basis, in permitted aquaculture facilities; the keeping, raising and feeding of livestock or poultry, including dairying, poultry, swine, sheep, beef cattle, pony and horse production, fur and wildlife farms, farm buildings used for growing, harvesting and preparing crop products for market, or for use on the farm; roadside stands, farm buildings

³⁴AGRICULTURAL AREAS CONSERVATION AND PROTECTION ACT, 505 ILCS 5/1, P.A. 81-1173 (2021).

³⁵ *Id.*



*for storing and protecting farm machinery and equipment from the elements, for housing livestock or poultry and for preparing livestock or poultry products for market; farm dwellings occupied by farm owners, operators, tenants or seasonal or year-round hired workers.*³⁶

Once an agricultural area has been created and has been established for 10 years, the agricultural area will be subject to review and will subsequently be subject to review every 8 years. Owners of land in an agricultural area may petition for the area’s dissolution 10 years after its creation. In addition to the requirements that agricultural areas only may be used for agricultural production, the law further establishes restrictions on local governing bodies:

*“No local government shall exercise any of its powers to enact local laws or ordinances within an agricultural area in a **manner which would unreasonably restrict or regulate farm structures or farming practices in contravention of the purposes of the act unless such restrictions or regulations bear a direct relationship to the public health or safety...** No political subdivision providing public services such as sewer, water, or lights or for non-farm drainage may impose benefit assessments or special ad valorem levies on land used for primarily agricultural production within an agricultural area on the basis of frontage, acreage, or value.”³⁷*

An additional important note is the decision of the Illinois Supreme Court in *Department of Transportation v. Keller*, which establishes the precedent that the AACPA does not preclude the government from using its power of eminent domain.³⁸

Impact on Agrivoltaics and Solar Grazing

Altogether, the impact of the AACPA on agrivoltaics is undetermined; however, the definitions of agricultural production used in the law seem unfavorable to farmer’s wishing to partner with a commercial solar developer for the purpose of constructing an agrivoltaics installation on the farmer’s agricultural land. The law may permit the construction of rooftop solar on farm structures. Additionally, the AACPA sets forth the standard for enacting local zoning and land use ordinances: that such ordinances shall not unreasonably restrict or regulate farm structures or farming practices.

³⁶ *Id.* at § 3.02.

³⁷ *Id.* at § 18.

³⁸ *Department of Transportation v. Keller*, 127 Ill. App. 3d 976, 469 N.E.2d 262 (Ill. App. Ct. 1984).



B. The Sustainable Agriculture Act (SAA)

The Sustainable Agriculture Act³⁹ was created to keep Illinois at the forefront of agricultural production in the 21st century through the promotion of efficient, environmentally sustainable production practices. The Act creates the Sustainable Agriculture Program charged with eight purposes:

- 1. Identify agricultural practices that maintain productivity and minimize environmental degradation.*
- 2. Relate overland runoff, sediment transport, streamflow quantity and quality, and ground water quantity (recharge) and quality to specific agricultural practices.*
- 3. Integrate and coordinate experiment field and on-farm research and educational efforts of cooperating individuals, agencies, institutions, and organizations.*
- 4. To test and refine alternative approaches to organizing and conducting on-farm research and demonstration projects.*
- 5. Test the organizational approach of joint farmer/specialist development of a computerized decision support system (expert system) as an approach to fostering sustainable agriculture.*
- 6. Develop an expert system embodying the expertise of experienced farmers and agency, institutional, and agribusiness specialists to help answer the question of what tillage and crop management system should be used in a particular field in a particular year.*
- 7. To test the usefulness of the existing conservation tillage knowledge base in making tillage system selection, implementation, and management decisions.*
- 8. To identify the most critical needs for research and educational programs related to sustainable agriculture.¹*

³⁹ SUSTAINABLE AGRICULTURE ACT, 505 ILCS, P.A. 86-1022 (2001).



The Illinois Department of Agriculture is designated as the administrator of the Sustainable Agriculture Program, and thus is responsible for the following:

- 1. Determining what production agriculture research projects currently being conducted fit into the purposes of the Act.*
- 2. Encouraging public and private institutions, including Illinois public universities, to establish production agriculture research projects.*
- 3. Allocating funds obtained by the Sustainable Agriculture Committee to the various research projects established as fitting the purposes of the Act.*
- 4. Acting as a clearinghouse to disseminate information concerning research projects funded by the program and the results of the research.*
- 5. Adopting rules necessary to carry out the provisions of the Act.¹*

Implications for Agrivoltaics and Solar Grazing

In the context of agrivoltaics, the SAA has the potential to expedite development of the industry through promoting agrivoltaics-related research projects. Importantly, the Act does not clearly state that farmers can use the Act as a reason to adopt experimental agricultural practices such as agrivoltaics; however, should agrivoltaics be determined as a research project fitting with the Sustainable Agriculture Act, and should promising results on the effectiveness of the production technique be published, farmers may be able to use the research as reasoning for adopting the practice on their own farms and defend it as a new agricultural production technique. This could be important in the context of agricultural areas, where definitions of agricultural production are strictly enumerated.

C. Renewable Energy Facilities Agricultural Impact Mitigation Act (REFAIM)

The REFAIM Act⁴² directly confronts the challenge of constructing wind and solar energy facilities on agricultural land by requiring the creation of a deconstruction plan for the facilities when they reach the end of their useful lifespan. This plan is formally called an “Agricultural impact mitigation agreement” and is entered into by the owner of the renewable energy facility and the Illinois Department of Agriculture. The agreement should include provisions such as restoration of the agricultural land and deconstruction of the energy facility at the end of life, as well as protections such as indemnification of landowners and financial assurance for deconstruction of the facility. The Illinois Department of Agriculture provides a standard

⁴² Renewable Energy Facilities Agricultural Impact Mitigation Act 505 ILCS 177/15 § 5, P.A. 99-132 (2018).



agricultural impact mitigation agreement on its website and requires the owners of a planned solar energy facility to submit their agreement to the Department of Agriculture at least 45 days prior to construction of the facility.

Commercial Solar Facility Qualifications

Additional aspects of note in the REFAIM Act are a legal definition of a “commercial solar facility” and the inclusion of targeted grazing on commercial solar facilities. According to the Act: “Commercial solar energy facility” “means a solar conversion facility equal to or greater than 500 kilowatts in total nameplate capacity, including a solar energy conversion facility seeking an extension of a permit to construct granted by a county or municipality before the effective date of this amendatory act”

Another important aspect is what does not count as a commercial solar energy facility: facilities that were issued a permit to construct or were constructed prior to the effective date of the act, facilities located on land owned by the owner of the commercial solar facility, and facilities that are located on the customer’s side of the meter that is used primarily to offset the customer’s electricity load and limited in size to up to 2,000 kilowatts.

Impact on Agrivoltaics and Solar Grazing

In addition to the land remediation responsibilities of the facility owner, the owner is also responsible for weed and vegetation control. Relevant to agrivoltaics is the enumerated use of livestock as a vegetation control method as long as this method is agreed to by the landowner. The construction of a solar facility on agricultural land under the Agricultural Impact Mitigation Agreement limits the structural composition of the solar facility to single pole support structures. The limitation on structural compositions may increase the risk of certain livestock that are big enough to cause structural damage in this circumstance.

In the case of agrivoltaics and solar grazing, a benefit of the REFAIM Act is that a grazier could sign an agreement with a solar developer to construct a solar facility on the grazier’s pasture and could then sign a separate agreement to maintain the vegetation with livestock. In this scenario, a grazier could collect payments from the developer both for use of the land and for use of the livestock for vegetation management, increasing farm revenues.

D. Illinois Municipal Code

The Illinois Municipal Code⁴³ enumerates several powers delegated to corporate authorities relevant to potential agrivoltaic developers.

First and foremost, the IMC gives corporate authorities powers directly relating to solar energy systems:

⁴³ Illinois Code Ch. 65 MUNICIPALITIES, 65 ILCS 5/ Illinois Municipal Code. Division 13 - Zoning 65 ILCS, § 11-13-1 (2010)



“to regulate or forbid any structure or activity which may hinder access to solar energy necessary for the proper functioning of a solar energy system, as defined in section 1.2 of the Comprehensive Solar Energy Act of 1977.”⁴⁴

For reference, the definition of a solar energy system in the Comprehensive Solar Energy Act of 1977 is as follows:

“a complete assembly, structure, or design of a solar collector, or a solar storage mechanism, which uses solar energy for generating electricity or for heating or cooling gases, solids, liquids, or other materials; the design, materials, or elements of a system and its maintenance, operation, and labor components, and the necessary components, if any, of supplemental conventional energy systems designed or constructed to interface with a solar energy system; and any legal, financial, or institutional orders, certificates, or mechanisms, including easements, leases, and agreements, required to ensure continued access to solar energy, its source, or its use in a solar energy system, and including monitoring and educational elements of a demonstration project.”⁴⁵

Special Use Permit Requirements

Additionally concerning agrivoltaics are the powers delegated to local government authorities regarding special uses. The Municipal Code defines special uses as uses that “may include but are not limited to public and quasi-public uses affected with the public interest, uses which may have a unique, special or unusual impact upon the use or enjoyment of neighboring property, and planned developments.” For a special use to be approved for construction, a public hearing on the proposed use must be held before the committee designated responsibility for approving the special use permits. Approval of the permit further requires evidence that the proposed use meets the established standards for special use classification as noted in the governing ordinances and approval may be subject to reasonable conditions. If the committee does not approve the proposed special use, it may be overturned by a majority vote of all aldermen, commissioners, or trustees holding office (note, municipalities are allowed to increase the vote requirement to two thirds rather than a simple majority).

Appeals

Applicants for a special use permit must include findings of facts and must refer to any exhibits containing plans and specifications for the proposed use or variation. When granted, the terms of relief must be specifically granted in a statement which must not be violated. Importantly, any person, officer, department, or bureau in the municipality in which the special use permit was granted may request an appeal within 45 days of approval of the special use permit. The appeal process halts any proceedings on the permit unless the permit involves imminent peril to life or property.

⁴⁴ *Id.*

⁴⁵ Comprehensive Solar Energy Act of 1977 30 ILCS 725/, P.A. 86-1475 § 1.2 (1977).



Amendments

Lastly, a zoning commission may propose an amendment to the zoning ordinance of the municipality. If so, a hearing must take place with prior notice of 15-30 days. If owners of property adjacent to the proposed amendment oppose the amendment, a written protest can be filed that requires a favorable vote of two thirds of aldermen or trustees holding office to pass the amendment.

Implications for Agrivoltaics and Solar Grazing

For farmers wishing to install solar energy systems on land zoned for agricultural use, the Illinois Municipal Code lays out the administrative process for obtaining special use permits—required by several counties in Illinois—to initiate the solar permit and development process. It is within this process that issues of zoning and taxation classifications may arise and require amendments to zoning, variances, or other unique permitting exceptions.