

## WOODBURY COUNTY BOARD OF SUPERVISORS AGENDA ITEM(S) REQUEST FORM

Date: 7/26/23 Weekly Agenda Date: 8/1/22 4:45

**ELECTED OFFICIAL / DEPARTMENT HEAD / CITIZEN:** Daniel Priestley

**WORDING FOR AGENDA ITEM:**

A) Receive Zoning Commission recommendation for Zoning Ordinance Text Amendments from their May 22, 2023 meeting. B) Public hearing to consider Zoning Ordinance Text Amendments to add solar energy systems (private use) as accessory uses in each zoning district, add solar energy systems (utility scale) as a conditional use in the AP and GI Zoning Districts to the land use summary table, amend the table of contents, definitions, and renumber definitions, and page numbers in the Woodbury County Zoning Ordinance. C) Approve the 1st Reading of the Ordinance Amendments.

**ACTION REQUIRED:**

Approve Ordinance ☒

Approve Resolution ☐

Approve Motion ☒

Public Hearing ☒

Other: Informational ☐

Attachments ☒

**EXECUTIVE SUMMARY:**

SUMMARY OF PROPOSED ZONING ORDINANCE TEXT AMENDMENTS: AN ORDINANCE AMENDING THE TEXT OF THE WOODBURY COUNTY ZONING ORDINANCE TO AMEND PORTIONS OF: THE TABLE OF CONTENTS; SECTION 3.03.4 ENTITLED: LAND USE SUMMARY TABLE OF ALLOWED USES IN EACH ZONING DISTRICT; PORTIONS OF: SECTION 6.02 ENTITLED DEFINITIONS; AND THE RENUMBERING OF DEFINITIONS AND PAGE NUMBERS. THE PROPOSAL IS TO ADD SOLAR ENERGY SYSTEMS (PRIVATE USE) AS ACCESSORY USES IN EACH ZONING DISTRICT AND TO ADD SOLAR ENERGY SYSTEMS (UTILITY SCALE) AS A CONDITIONAL USE IN THE AGRICULTURAL PRESERVATION ZONING DISTRICT AND THE GENERAL INDUSTRIAL ZONING DISTRICT.

**BACKGROUND:**

The Board will hold a public hearing and the first reading of the proposed ordinance to amend the Woodbury County Zoning Ordinance to consider adding solar energy systems (private use) as accessory uses in each zoning district, add solar energy systems (utility scale) as a conditional use in the AP and GI Zoning Districts to the land use summary table, amend the table of contents, definitions, and renumber definitions, and page numbers in the Woodbury County Zoning Ordinance.

**FINANCIAL IMPACT:**

0

**IF THERE IS A CONTRACT INVOLVED IN THE AGENDA ITEM, HAS THE CONTRACT BEEN SUBMITTED AT LEAST ONE WEEK PRIOR AND ANSWERED WITH A REVIEW BY THE COUNTY ATTORNEY'S OFFICE?**

Yes ☐ No ☐

**RECOMMENDATION:**

Receive the Zoning Commission's recommendation their May 22, 2023 meeting.

Open and close the public hearing. (Set Time: 4:45 PM)

Conduct and approve the first reading of the ordinance.

The 2nd and 3rd public hearings and readings of the ordinance have been scheduled for Tuesday, August 8 at 4:45 PM and Tuesday, August 15 at 4:45 PM.

**ACTION REQUIRED / PROPOSED MOTION:**

A) Motion to receive Zoning Commission recommendation for Zoning Ordinance Text Amendments from their May 22, 2023 meeting.

B) Open and close the Public Hearing (Set Time: 4:45 PM) to consider Zoning Ordinance Text Amendments to add solar energy systems (private use) as accessory uses in each zoning district, add solar energy systems (utility scale) as a conditional use in the AP and GI Zoning Districts to the land use summary table, amend the table of contents, definitions, and renumber definitions, and page numbers in the Woodbury County Zoning Ordinance.

C) Motion to conduct and approve the 1st Reading of the Ordinance Amendments

ORDINANCE NO. \_\_\_\_\_

WOODBURY COUNTY, IOWA

AN ORDINANCE AMENDING THE TEXT OF THE WOODBURY COUNTY ZONING ORDINANCE TO AMEND PORTIONS OF: THE *TABLE OF CONTENTS*; SECTION 3.03.4 ENTITLED: *LAND USE SUMMARY TABLE OF ALLOWED USES IN EACH ZONING DISTRICT*; PORTIONS OF: *SECTION 6.02 ENTITLED DEFINITIONS*; AND THE RENUMBERING OF DEFINITIONS AND PAGE NUMBERS.

NOW, THEREFORE, BE IT ENACTED BY THE BOARD OF SUPERVISORS OF WOODBURY COUNTY, IOWA THAT THE BELOW ZONING ORDINANCE LANGUAGE AMENDMENTS BE MADE:

**Amendment #1 –**

On page 39: To add the following line item use language within zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the “Utilities” category:

“Solar Energy Systems (Private use)”. With placement of the letter “A” within the AP (Agricultural Preservation), AE (Agricultural Estates), NR (Non-Agricultural Residential Zoning District), SR (Suburban Residential), GC (General Commercial), HC (Highway Commercial), LI (Limited Industrial), and GI (General Industrial) zoning districts columns on the table related to this line item use.

On page 92: To add the following definition, “Solar Array” as definition 158 to Article 6. Definitions. Section 6.02: Definitions as “158. Solar Array. Equipment used for private or utility scale solar energy systems. Can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure.”

On page 92: To add the following definition, “Solar Energy Systems, Private” as definition 159 to Article 6. Definitions. Section 6.02: Definitions as “159. Solar Energy Systems, Private. An energy system that converts solar energy to usable thermal, mechanical, chemical, or electrical energy primarily for immediate onsite use that already has an existing principal use on the same parcel. Solar Energy Systems, Private shall be allowed only as a non-utility scale accessory use to a permitted principal use. Surplus energy sold back to a utility must comply with all applicable laws including but not limited to Section 199, Chapter 15.11(5) of *Iowa Administrative Code*, and all requirements of the Iowa Utilities Board. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure.”

**Amendment #2 –**

On page 39: To add the following line item use language within zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the “Utilities” category:

“Solar Energy Systems, Utility Scale”. With placement of the letter “C” within the AP (Agricultural Preservation) and the GI (General Industrial) zoning districts columns on the table related to this line item use and with the placement of “--” in the AE (Agricultural Estates), NR (Non-Agricultural Residential Zoning District), SR (Suburban Residential), GC (General Commercial), HC (Highway Commercial), and LI (Limited Industrial) zoning districts columns on the table related to this line item use.

On page 92: To add the following definition of “Solar Energy Systems, Utility Scale” as definition 160 to Article 6. Definitions. Section 6.02: Definitions as “160. Solar Energy Systems, Utility Scale. An energy system, commonly referred to as a “solar farm”, which converts solar energy to useable thermal, mechanical, chemical, or electrical energy primarily for transmission through the electrical grid for offsite use or wholesale and/or retail sale. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure. Utility scale solar energy systems do not include concentrating solar power (CSP) systems.”

**Amendment #3 –**

Beginning on page 92, to re-designate or re-number the definitions in Article 6. Definitions. Section 6.02: Definitions 158 through 188. The purpose is to add “Solar Array” as definition 158, “Solar Energy Systems, Private” as Definition 159, and “Solar Energy Systems, Utility Scale” as Definition 160 thereby pushing the existing definitions 158 through 188 ahead three positions with Article 6. Definitions. Section 6.02 now including definitions 1 through 191.

Beginning on page 82, to amend Article 6. Definitions by moving the start page from page 82 to page 83.

On page iii: To repeal and replace “Section 6.01: Construction of Terms ..... 82” with “Section 6.01 Construction of Terms ..... 83”

On page iii: To repeal and replace “Section 6.02: Definitions ..... 82” with “Section 6.01: Definitions ..... 83”

Adopted this \_\_\_\_ day of \_\_\_\_, 2023

**THE WOODBURY COUNTY BOARD OF SUPERVISORS**

\_\_\_\_\_  
Matthew Ung, Chairman

\_\_\_\_\_  
Jeremy Taylor, Vice-Chairman

\_\_\_\_\_  
Daniel Bittinger II

Attest:

\_\_\_\_\_  
Mark Nelson

\_\_\_\_\_  
Patrick Gill, Woodbury County Auditor

\_\_\_\_\_  
Keith Radig

Adoption Timeline:

Date of Public Hearing and First Reading \_\_\_\_\_

Date of Public Hearing and Second Reading \_\_\_\_\_

Date of Public Hearing and Third Reading \_\_\_\_\_

Date of Adoption \_\_\_\_\_

Published/Effective Date \_\_\_\_\_



## WOODBURY COUNTY COMMUNITY & ECONOMIC DEVELOPMENT

620 Douglas St. · Sixth Floor · Sioux City, IA 51101 · Phone: 712.279.6609 · Fax: 712.279.6530 · Web: woodburycountyiowa.gov

Daniel J. Priestley, MPA – Zoning Coordinator · dpriestley@woodburycountyiowa.gov

Dawn Norton – Senior Clerk · dnorton@woodburycountyiowa.gov

### ZONING ORDINANCE RECOMMENDATION FROM WOODBURY COUNTY ZONING COMMISSION REPORT – 7/25/23

TIMELINE BOARD	DATE	ACTION TAKEN
Board of Supervisors	April 4, 2023	Directed zoning to evaluate solar power in unincorporated areas.
Zoning Commission	April 24, 2023	Information item. Public hearing arranged for May 22, 2023.
Board of Adjustment	May 1, 2023	Information Item. Draft proposal shared with board.
Zoning Commission	May 22, 2023	Considered and approved proposal for private accessory solar and utility-scale solar in the Agricultural Preservation (AP) and General Industrial (GI) Zoning Districts with recommendation to include net-metering opportunities for private-use accessory systems.
Board of Adjustment	June 5, 2023	Information item. Draft proposal shared with board.
Zoning Commission	June 26, 2023	Proposal brought back to Zoning Commission for final look prior to the setting of Board of Supervisor's public hearing dates/times.
Board of Adjustment	July 3, 2023	Information item. Draft proposal shared with board.
Board of Supervisors	July 11, 2023	Voted to schedule August 1 at 4:45 PM, August 8 at 4:45 PM, and August 15 at 4:45 as dates for three (3) public hearings to consider solar amendments to the zoning ordinance.
Board of Supervisors	August 1, 2023, 4:45 PM	Public Hearing #1
Board of Supervisors	August 8, 2023, 4:45 PM	Public Hearing #2
Board of Supervisors	August 15, 2023, 4:45 PM	Public Hearing #3

#### SUMMARY

On April 4, 2023, the Woodbury County Board of Supervisors directed zoning to evaluate solar power in the unincorporated areas. A proposal to consider private solar as an accessory use in all zoning districts and utility scale solar as a conditional use in the Agricultural Preservation (AP) and General Industrial (GI) Zoning Districts was placed on the Zoning Commission's April 24, 2023 agenda as an information item to begin the process of setting up a public hearing for May 22, 2023. At the May 22 public hearing, three amendments were discussed:

- Amendment #1 addresses and defines accessory solar uses for private landowners. Solar arrays would be considered accessory structures and would be permitted with the issuance of a building permit to serve the property in which it is located.
- Amendment #2 sets uses for commercial or utility scale solar systems and would require a conditional use permit application in the AP and GI Zoning Districts which requires review by the Zoning Commission and approval by the Board of Adjustment.
- Amendment #3 address the redesign and renumbering of definitions of sections 6.01 and 6.02.

The Commissioners voted unanimously to recommend approval to the Board of Supervisors for their consideration but also directed staff to send the proposal to the county attorney's office to include language acknowledging net metering opportunities. The draft proposal was updated and shared as an information item with the Zoning Commission at their June 26, 2023 meeting. This review process has also been shared with the Board of Adjustment at their May 1, 2023, June 5, 2023, and July 3, 2023 meetings. At the June 26, 2023 Zoning Commission meeting, the Commissions looked over the net metering changes that they requested on May 22, 2023 and were ready for this to proceed to the Board of Supervisors for consideration. On July 11, 2023, the Board of Supervisors voted to schedule August 1 at 4:45 PM, August 8 at 4:45 PM, and August 15 at 4:45 as dates for three (3) public hearings consider the said amendments.

#### REPORT CONTENTS

- Timeline
- Summary
- Zoning Commission and Staff Recommendation
- Proposed Ordinance Amendments
- Minutes Of the Zoning Commission – April 24, 2023
- Minutes Of the Zoning Commission – May 22, 2023
- Minutes Of the Zoning Commission – June 26, 2023
- Staff Analysis – Current Zoning
- Development Plan and Zoning Ordinance
- Possible Options and Examples from Other Counties
- Legal Publication
- Stakeholder Comments
- Draft Ordinance Proposal

#### ZONING COMMISSION AND STAFF RECOMMENDATION

The Zoning Commission voted unanimously following the May 22, 2023 public hearing to recommend approval of this proposal to the Board of Supervisors. Staff recommends approval of the proposal as this includes both the consideration of private accessory use and utility scale use. It is imperative to note that the debate of this ordinance in terms of utility scale is about which zoning district(s) are appropriate for utility scale solar applications to be considered as conditional uses by the Zoning Commission and the Board of Adjustment. All or portions of this proposal could be considered for adoption.



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Adopted this \_\_\_\_ day of \_\_\_\_, 2023

**THE WOODBURY COUNTY BOARD OF SUPERVISORS**

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Jeremy Taylor, Vice-Chairman

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Daniel Bittinger II

Attest:

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Mark Nelson

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Patrick Gill, Woodbury County Auditor

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**Minutes – Woodbury County Zoning Commission Meeting – April 24, 2023**

The Zoning Commission (ZC) meeting convened on the 24th of April at 6:00 PM in the first-floor boardroom in the Woodbury County Courthouse. The meeting was also made available via teleconference.

ZC Members Present:

Chris Zant, Corey Meister, Jeff O'Tool, Tom Bride

County Staff Present:

Dan Priestley, Dawn Norton

Public Present:

Doyle Turner, Leo Jochum, John Daniels, Sid Mosher, Matt Mosher, Adam Larson, Bill Holland, Dakin Schultz, Jason Klemme, Aaron Vargas (via teleconference)

**Call to Order**

Chair Chris Zant formally called the meeting to order at 6:01 PM.

**Public Comment on Matters Not on the Agenda**

None

**Approval of Previous Meeting Minutes – March 27, 2023**

O'Tool motioned. Second: Meister. Motion carried: 4-0.

**Public Hearing: Niemeyer Addition, Minor Subdivision Proposal on Parcel #894607100006**

Priestley read the preliminary report and staff recommendation into the record. Marilyn Niemeyer, as Trustee of Edwin O. Niemeyer Revocable Trust has filed a one (1) lot minor subdivision on parcel #894607100006. This subdivision application is being considered concurrently with a Condition Use Permit application to use the proposed 4.500 acres for Mosher Landscaping which provides landscaping and other services. This proposal has been properly noticed in the Sioux City Journal Legals Section on April 8, 2023. Neighbors within 1000 FT have been duly notified via an April 14, 2023 letter about the April 24, 2023 Zoning Commission Public Hearing. Appropriate stakeholders including government agencies, utilities and organization have been notified and have been requested to comment. The Woodbury County Engineer found the proposal in compliance with Iowa Code closure requirements and found the new lot has adequate access. The Engineer did reference the consistency with the legal description and stated the remaining land will need to receive a driveway permit unless an easement agreement is included. After clarification, both parties have made arrangements via purchase agreement. The purchase agreement states, "after closing, buyer agrees to grant access easement to Seller, and any ancillary thereto, so that Seller can access its adjoining real estate". Extraterritorial review, as required by Iowa Code 354.9, was completed by the City of Sioux City on March 27, 2023, with the passage of City Council Resolution No. 2023-0311. This property is located in the Agricultural Preservation (AP) Zoning District and is not located in the Special Flood Hazard Areas (SFHA). Based on the information received and the requirements set forth in the Zoning and Subdivision Ordinance, the proposal meets the appropriate criteria for approval. Priestley noted extraterritorial review was completed, the City of Sioux City is not currently planning on annexing but may in the future when city water is available in that area. Motion to close public hearing: O'Tool. Second: Meister. Motion approved 4-0. Motion to recommend the approval of the Niemeyer Addition to the Board of Supervisors: O'Tool. Second: Meister. Motion carried 4-0.

**Review of Conditional Use Permit Application: Landscaping Services, Nursery Business, and Other Related Uses, Etc., on Parcel #894607100006**

Priestley read into record the summary of the Conditional Use Permit Proposal. Marilyn Niemeyer, as Trustee of the Edwin O. Niemeyer Revocable Trust (Owner) and Sid Mosher (Applicant) has filed for a conditional use permit application to use the property for landscaping and nursery on a portion of the property identified as Parcel #894607100006 and referenced above. Although horticultural production (including nurseries & greenhouses) are principally allowed uses in the AP Zoning District, a conditional use permit is required for similar landscaping uses such as tree services, sand and gravel storage, and feed and seed sales, fertilizer storage/distribution/application, and other related uses to a landscaping business. This conditional use permit application is being considered concurrently with a one-lot minor subdivision application to establish a 4.5-acre lot. This proposal has been properly noticed in the Sioux City Journal Legals Section on April 15, 2023. The neighbors within 1000 FT have been duly notified via April 14, 2023 letter about the May 1, 2023 Board of Adjustment Public Hearing. Appropriate stakeholders including government agencies, utilities, and organizations have been notified and have been requested to comment. This property is located in the Agricultural Preservation (AP) Zoning District and is not located in the Special Flood Hazard Area (SFHA). Based on the information received and the requirements set forth in the Zoning Ordinance, the proposal meets the appropriate criteria for approval. Staff recommends



approval. Motion by Meister to recommend approval of the conditional use request to allow for this property to be used as a landscaping and nursery business with associated uses including tree services, sand and gravel storage, feed and seed sales, fertilizer storage/distribution/application, and other uses related to a landscaping business. Second: O'Tool. Motion carried 4-0.

**Review of Conditional Use Permit Application: Vendor Sales of Alcohol During RAGBRAI on Parcel #894407100006, 2590 110<sup>th</sup> St., Merville, IA 51039**

Priestley read the proposed Conditional Use Permit proposal into the record. Backpack Brewing (Applicant) and property owners Chad and Tara Schmitt have filed for a Conditional Use Permit application to sell alcohol during RAGBRAI's visit through Woodbury County on July 23, 2023. The proposed sales site is on Parcel #894407100006. The parcel is located in the Agricultural Preservation (AP) Zoning District and is not located in the floodplain. The Woodbury County Board of Supervisors approved Ordinance #69, effective November 16, 2022, authorizing this request as a conditional use in the AP District. Based on the information received and the requirements set forth in the Zoning and Subdivision Ordinance, the proposal meets the appropriate criteria for approval. Staff recommends approval. Aaron Vargas spoke on behalf of Backpack Brewing. Motion by O'Tool to recommend approval and forward to Board of Adjustment the conditional use permit application to allow sales of alcohol only during the Special Event of RAGBRAI on July 23, 2023 with the condition that the property owner/applicant shall obtain all necessary federal, state, and local permits including, but not limited to liquor licensing; and the permit shall terminate at 11:59 PM CT on July 23, 2023. Second: Bride. Motion carried 4-0.

**Review of Conditional Use Permit Application: Temporary Borrow Pits on Two Proposed Borrow Areas: Borrow Area #1: Parcel(s) 884704200001 & 884704200003; Borrow Area #2: Parcel(s): 884702100006**

JB Holland Construction, Inc. (Applicant) and property owners Eric Hennings and Donald Hennings of the Hennings Joint Trust have filed for a Conditional Use Permit application to establish temporary borrow sites to remove earthen materials to be used in Phase 1 and 2 of the east bound Highway 20 project (IDOT Project #17-97-020-010). The proposed temporary borrow areas are located on Parcel #884704200001, Parcel #884704200003 and Parcel #884702100006. Both parcels are located on the south side of Highway 20. Each parcel is currently used as farm ground. The proposed cut area on Parcel #884704200001 and Parcel #884704200003 is 8-10 acres. The work area is 10 acres and the total excavation for export is 100,000-150,000 yds<sup>3</sup>. The proposed cut area on Parcel #884702100006 is 8-10 acres. The work area is 10 acres, and the total excavation for export is 100,000-150,000 yds<sup>3</sup>. The parcels are located in the Agricultural Preservation (AP) Zoning District and a portion of Parcel #884702100006 is located in the floodplain. However, this area will not be a part of the borrow site. The applicants have provided the necessary documentation for storm water management, soil erosion, dust control, haul routes, traffic entrances, hours of operation, and duration of operations. Appropriate stakeholders including government agencies, utilities, and organizations have been notified and have been requested to comment. Based on the information received and the requirements set forth in the Zoning and Subdivision Ordinance, staff recommends approval of Temporary Borrow Area #2 with the condition that an archeological study be completed for the area and approval of Temporary Borrow Area #1 with the condition that an archeological study also be completed for the area and that approval is contingent on a written agreement between Magellan Midstream Partners L.P. and the property owners and applicants that the active pipeline be removed at the location before any borrow activity can proceed. Without a verified written agreement, it is recommended by staff to deny the application for Temporary Borrow Area #1. Pipeline agreement has not been made as of April 24, 2023. Bill Holland stated the area is currently farmland, after completion of the project, area will be graded and returned to farmland. Motion by O'Tool to recommend approval of Temporary Borrow Area #2 with the condition that the final archaeological study be completed for the area and with the condition that approval is contingent on a written agreement between Magellan Midstream Partners L.P., the property owners, and applicants that the pipeline be removed at the location before any borrow activity can proceed. Without a verified written agreement, it is recommended to deny the application for Temporary Borrow Area #1. Second: Meister. Motion carried 4-0.

**Information/Discussion: Woodbury County Solar Energy Requirements Review for Possible Changes to Zoning Ordinance**

Priestley informed the Commission that on April 4, 2023, the Woodbury County Board of Supervisors directed zoning to evaluate solar power in the unincorporated areas of the county. Solar energy generation can be classified into two categories including personal or private and utility scale systems. The permitting or allowed use of solar panels in Woodbury County is three-fold. First, utility solar scale systems are only allowed for consideration as a conditional use in the General Industrial (GI) Zoning District. They are prohibited in all of the other zoning classifications. Second, personal or private systems are considered in each zoning district via the conditional use permit process. Lastly, it is possible that the Agricultural Exemption in Iowa Code 335.2 could be

invoked for farms to utilize solar energy as a means of supporting their operation by being primarily adapted agricultural purposes. As noted, the Woodbury County Zoning Ordinance prohibits commercial large-scale electrical energy generation (not including wind) in each zoning district except for General Industrial (GI). Within the GI Zoning District, a conditional use permit application is required to be reviewed by the Zoning Commission and considered for approval by the Board of Adjustment. Under this policy, utility scale solar panel systems are prohibited on farmland (and all districts except GI) unless a farming operation uses them under the parameters of the agricultural exemption as enumerated in Iowa Code 335.2. If there is no agricultural exemption and the landowner resides on agricultural land, the ordinance prohibits electric energy generation (not including wind). If a landowner desires to use several acres of land in the Agricultural Preservation (AP) Zoning District, they would first need to achieve a rezone from the AP to the GI Zoning District. However, since spot zoning by convention is not a widely accepted practice, and that much of the future land use map does not provide for industrial activities in agricultural areas (see Future Land Use Map below), the chances are minimal for the zoning designation to change in order to consider a commercial solar conditional use permit on AP zoned land. The Commission discussed some potential paths to address solar including focusing on amending the private systems to be allowed as an accessory use via building permit. They also discussed the possibility of making the consideration of the conditional use permit an option in the Agricultural Preservation (AP) Zoning District. Leo Jochum and Doyle Turner offered comments about solar including the CSR ratings. Jochum discussed potential areas in the county that could facilitate solar. Turner offered concerns about the CSR and suggested the siting of solar from a slope standpoint instead. The Commission discussed having a public hearing next month to consider amendments to the zoning ordinance.

**Information/Discussion: Summary of Proposed Revisions to Woodbury County Ordinance #56:**

Priestley informed the Commission that the Board of Supervisors are looking toward amending the wind energy ordinance, Ordinance #56. The proposed public hearing dates are May 9, 16 and 23. The proposal is to amend portions of Woodbury County Ordinance #56: an amendment to modify section 6.1.A: wind turbines set back requirements to increase certain setback requirements in the ordinance regulating commercial wind energy conversion systems in unincorporated Woodbury County. Amendment #1: On page 10, Section 6.1.A, to repeal and replace the Wind Turbine Set Back Requirement for the City Limits Protected Area from 600 feet to 2 miles. Amendment #2: On page 10, Section 6.1.A, to repeal and replace the Wind Turbine Set Back Requirement for the Public Conservation Protected Area from 600 feet or 110% of total height (whichever is greater) to 2,640 feet or 4.5x tower height (whichever is greater).

**Information/Discussion: Woodbury County Comprehensive Plan 2040 Update**

SIMPCO will present a draft version of the 2040 Comprehensive Plan at an Open House on Wednesday, April 26th from 5:00 – 6:30 in the basement meeting room of the courthouse to review the plan and receive comments on the future development of Woodbury County. Everyone is encouraged to attend and offer input.

**Public Comment on Matters Not on the Agenda**

None

**Commissioner Comment or Inquiry**

None

**Staff Update**

Iowa State University Extension and Outreach will provide a Zoning Training session on April 27, 2023 at the Hilton Garden Inn on April 27, 2023. Board of Supervisors, Zoning Commission, and Board of Adjustment members are invited to attend. The Federal government is getting closer to implementation of the new FEMA maps. The 90-day appeal period will be up through July 24, 2023.

**Adjourn**

Motion by O'Tool. Second: Meister. Carried 4-0. The meeting adjourned at 7:29 PM.



**Minutes - Woodbury County Zoning Commission Meeting – May 22, 2023**

The Zoning Commission (ZC) meeting convened on the 22<sup>nd</sup> of May at 6:00 PM in the basement meeting room in the Woodbury County Courthouse. The meeting was also made available via teleconference.

ZC Members Present:

Chris Zant, Corey Meister, Jeff O'Tool, Tom Bride, Barb Parker

County Staff Present:

Dan Priestley, Dawn Norton

Public Present:

Gayle Palmquist, Tom Treharne, Leo Jochum, JP Baric, Jarrod Ufert, Lydia Gaunitz, Alan Fagan, Adam Larson, Corinne Erickson, Erin Berzina, Doyle Turner

**Call to Order**

Chair Chris Zant formally called the meeting to order at 6:00 PM.

**Public Comment on Matters Not on the Agenda**

None

**Approval of Previous Meeting Minutes – April 24, 2023**

O'Tool motioned. Second: Bride. Motion carried: 5-0.

**Public Hearing: Homestead 1867 Addition, Second Filing, Minor Subdivision Proposal on Parcel #884405200009**

Priestley read the preliminary report and staff recommendation into the record. John Weaver and Brian Weaver have filed for a two (2) lot minor subdivision to be known as Homestead 1867 Addition, Second Filing on the property identified as Parcel #884405200009. This agricultural subdivision proposal has been properly notified in the Sioux City Journal Legals Section on May 12, 2023. The neighbors within 1000 FT have been duly notified via a May 5, 2023 letter about the May 22, 2023 Zoning Commission Public Hearing. Appropriate stakeholders including government agencies, utilities and organization have been notified and have been requested to comment. The Woodbury County Engineer found the proposal in compliance with Iowa Code closure requirements and found the new lot has adequate access. The engineer recommends that the owners prepare a clearly written easement agreement to cover issues such as snow removal and maintenance of the shared access driveway and record the easement for the benefit of future owners. This property is located in the Agricultural Preservation (AP) Zoning District and is not located in the Special Flood (SFHA). Extraterritorial review is not required as the property exceeds two (2) miles from an incorporated jurisdiction. Based on the information received and the requirements set forth in the Zoning and Subdivision Ordinance, the proposal meets appropriate criteria for approval.

Motion to close public hearing: Parker. Second: Meister. Motion approved 5-0. Motion by O'Tool to recommend the approval of the Homestead 1867 Addition, Second Filing to the Board of Supervisors with the condition that the owners prepare a clearly written easement agreement to cover issues such as snow removal and maintenance of the shared access driveway and record the easement for the benefit of future owners. Second: Parker. Motion carried 5-0.

**Public Hearing: Public Hearing: Solar Energy Systems Amendments Proposal to Woodbury County Zoning Ordinance. Summary of Proposed Zoning Ordinance Text Amendments:**

Priestly read into record the SUMMARY OF PROPOSED ZONING ORDINANCE TEXT AMENDMENTS: AN ORDINANCE AMENDING THE TEXT OF THE WOODBURY COUNTY ZONING ORDINANCE TO AMEND PORTIONS OF: THE TABLE OF CONTENTS; SECTION 3.03.4 ENTITLED: LAND USE SUMMARY TABLE OF ALLOWED USES IN EACH ZONING DISTRICT; PORTIONS OF: SECTION 6.02 ENTITLED DEFINITIONS; AND THE RENUMBERING OF DEFINITIONS AND PAGE NUMBERS. THE PROPOSAL IS TO ADD SOLAR ENERGY SYSTEMS (PRIVATE USE) AS ACCESSORY USES IN EACH ZONING DISTRICT AND TO ADD SOLAR ENERGY SYSTEMS (UTILITY SCALE) AS A CONDITIONAL USE IN THE AGRICULTURAL PRESERVATION ZONING DISTRICT AND THE GENERAL INDUSTRIAL ZONING DISTRICT.

Priestly explained Amendment #1 addresses and defines solar uses for private landowners. Solar array would be considered an accessory structure and could be permitted with issuance of building permit. Amendment #2 sets uses for commercial or utility scale arrays and would require a conditional use application. Amendment #3 addresses the redesign and renumbering of definitions of sections 6.01 and 6.02. Bride brought up net metering, where the electric company would roll back equal for extra energy produced, for benefit for private owners on only that parcel. Bride suggested sending proposal to County Attorney for rewriting the to include net metering for private use arrays, recommending restricting utility scale arrays from Loess Hills areas or slope areas. Motion to close public hearing: O'Tool. Second: Bride. Motion carried 5-0.

WOODBURY COUNTY, IOWA

AN ORDINANCE AMENDING THE TEXT OF THE WOODBURY COUNTY ZONING ORDINANCE TO AMEND PORTIONS OF: THE *TABLE OF CONTENTS*; SECTION 3.03.4 ENTITLED: *LAND USE SUMMARY TABLE OF ALLOWED USES IN EACH ZONING DISTRICT*; PORTIONS OF: *SECTION 6.02 ENTITLED DEFINITIONS*; AND THE RENUMBERING OF DEFINITIONS AND PAGE NUMBERS.

NOW, THEREFORE, BE IT ENACTED BY THE BOARD OF SUPERVISORS OF WOODBURY COUNTY, IOWA THAT THE BELOW ZONING ORDINANCE LANGUAGE AMENDMENTS BE MADE:

**Amendment #1 –**

On page 39: To add the following line item use language within zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the "Utilities" category:

"Solar Energy Systems (Private use)". With placement of the letter "A" within the AP (Agricultural Preservation), AE (Agricultural Estates), NR (Non-Agricultural Residential Zoning District), SR (Suburban Residential), GC (General Commercial), HC (Highway Commercial), LI (Limited Industrial), and GI (General Industrial) zoning districts columns on the table related to this line item use.

On page 92: To add the following definition, "Solar Array" as definition 158 to Article 6. Definitions. Section 6.02: Definitions as "158. Solar Array. Equipment used for private or utility scale solar energy systems. Can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure."

On page 92: To add the following definition, "Solar Energy Systems, Private" as definition 159 to Article 6. Definitions. Section 6.02: Definitions as "159. Solar Energy Systems, Private. An energy system that converts solar energy to useable thermal, mechanical, chemical, or electrical energy for immediate onsite use that already has an existing principal use on the same parcel. Solar Energy Systems, Private shall be allowed only as an accessory use to a permitted principal use. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure."

**Amendment #2 –**

On page 39: To add the following line item use language within zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the "Utilities" category:

"Solar Energy Systems, Utility Scale". With placement of the letter "C" within the AP (Agricultural Preservation) and the GI (General Industrial) zoning districts columns on the table related to this line item use and with the placement of "--" in the AE (Agricultural Estates), NR (Non-Agricultural Residential Zoning District), SR (Suburban Residential), GC (General Commercial), HC (Highway Commercial), and LI (Limited Industrial) zoning districts columns on the table related to this line item use.

On page 92: To add the following definition of "Solar Energy Systems, Utility Scale" as definition 160 to Article 6. Definitions. Section 6.02: Definitions as "160. Solar Energy Systems, Utility Scale. An energy system, commonly referred to as a "solar farm", which converts solar energy to useable thermal, mechanical, chemical, or electrical energy for transmission through the electrical grid for offsite use or whole sale and/or retail sale. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure. Utility scale solar energy systems do not include concentrating solar power (CSP) systems."



**Amendment #3 –**

Beginning on page 92, to re-designate or re-number the definitions in Article 6. Definitions. Section 6.02: Definitions 158 through 188. The purpose is to add "Solar Array" as definition 158, "Solar Energy Systems, Private" as Definition 159, and "Solar Energy Systems, Utility Scale" as Definition 160 thereby pushing the existing definitions 158 through 188 ahead three positions with Article 6. Definitions. Section 6.02 now including definitions 1 through 191.

Beginning on page 82, to amend Article 6. Definitions by moving the start page from page 82 to page 83.

On page iii: To repeal and replace "Section 6.01: Construction of Terms ..... 82" with "Section 6.01 Construction of Terms ..... 83"

On page iii: To repeal and replace "Section 6.02: Definitions ..... 82" with "Section 6.01: Definitions ..... 83"

**THE WOODBURY COUNTY BOARD OF SUPERVISORS**

\_\_\_\_\_  
Matthew Ung, Chairman

\_\_\_\_\_  
Jeremy Taylor, Vice-Chairman

\_\_\_\_\_  
Daniel Bittinger II

Attest:

\_\_\_\_\_  
Mark Nelson

\_\_\_\_\_  
Patrick Gill, Woodbury County Auditor

\_\_\_\_\_  
Keith Radig

Adoption Timeline:

Date of Public Hearing and First Reading \_\_\_\_\_

Date of Public Hearing and Second Reading \_\_\_\_\_

Date of Public Hearing and Third Reading \_\_\_\_\_

Date of Adoption \_\_\_\_\_

Published/Effective Date \_\_\_\_\_

**Review of Conditional Use Permit Application: Temporary Borrow Pit on Parcel #884702100002.**

Priestley read into record the summary of the Conditional Use Permit Proposal. JB Holland Construction, Inc. (Applicant) and property owner Donald Hennings of the Hennings Joint Trust have filed for a Conditional Use Permit application to establish a temporary borrow site to remove earthen materials to be used in Phase 1 and 2 of the east bound Highway 20 project (IDOT Project #17-97-020-010). The proposed temporary borrow area is located on Parcel #884702100002. The parcel is located on the south side of Highway 20 and is currently used as farm ground. The proposed cut area is 8-10 acres. The work area is 10 acres and the total exaction for export is 100,000-15,000 yds<sup>3</sup>. The parcel is located in the Agricultural Preservation (AP) Zoning District and not in the floodplain. The application(s) have provided the necessary documentation for storm water management, soil erosion, dust control, haul routes, traffic entrances, hours of operation, and duration of operations. Appropriate stakeholders including government agencies, utilities, and organizations have been notified and have been requested to comment. Based on the information received and the requirements set forth in the Zoning and Subdivision Ordinance, the proposal meets the appropriate criteria for approval. Motion to recommend approval of the temporary borrow pit by Meister; Second: O'Tool. Motion carried: 5-0.



**Review of Conditional Use Permit Application: Operation of Data Processing Business to Place a Demand Response Load Resource Next to the Substation in conjunction with Local Electric utility to Support Grid Resiliency on Parcel #864723300010.**

Priestly introduced the proposal of WIFI LLC (Applicant) and property owners Brenden Patricia A. Revocable Trust have filed a Condition Use Permit application "to place a demand response load resource next to the substation in conjunction with local electric utility to support grid resiliency" for the proposed use to operate a data processing business. The proposed site is on Parcel #864723300010. The parcel is located in the Agricultural Preservation (AP) Zoning District and is not located in the floodplain. The Land Use Summary Table (Section 3.03.4) of the Woodbury County Zoning Ordinance does not reference data processing or this specific request by the applicant. However, this can be interpreted under Section 3.03.3 of the Woodbury County Zoning Ordinance as a comparable utility use or comparable to the industrial use of research and development laboratories in the sense of data analysis. Therefore, the purposes of this request, data processing can be interpreted as a conditional use under section 3.03.3 in the Agricultural Preservation (AP) Zoning District. Hence, based on the information received and the requirements set forth in the Zoning and Subdivision Ordinance, the proposal meets the appropriate criteria for approval. John Baric provided information sheets for the Commissioners. Motion to receive: Bride; Second: O'Tool. Carried: 5-0. REC has provided a letter of support. The center would even the supply and demand of power and be located next to the Lakeport Substation. Motion by Bride to recommend approval of the conditional use permit "to place a demand response load resource next to the substation in conjunction with local electric utility to support grid resiliency" for the proposed use to operate a data processing business. Second: O'Tool. Motion carried: 5-0.

**Information/Discussion: Woodbury County Comprehensive Plan 2040 Presentation by SIMPCO**

Representatives from SIMPCO gave an overview of the progress and status of the 2040 Comprehensive Plan. The new plan is not ridged or set in stone, incorporates the existing plan. A draft plan is complete; however, comments and suggestions can still be submitted to SIMPCO's website or Facebook site. Comment section will end June 16<sup>th</sup>, then will be presented to stakeholders.

**Information/Discussion: Meeting Time and Location for the Woodbury County Zoning Commission as Referenced in the Rules of Procedure**

Staff has been approached to consider a change in meeting time/location of meetings. Zoning Commission voted to possibly move meetings to 4:30 or 5:00. Board of Supervisors has input in decision. Board of Adjustment will also be asked to consider changes.

**Public Comment on Matters Not on the Agenda**

Tom Trehame recommended the new Comprehensive Plan include renewable energy.

**Staff Update**

**Priestley mentioned** the 3<sup>rd</sup> reading by the Board of Supervisors for the Wind Ordinance amendment will be on May 23 addressing increased setbacks for Conservation areas.

Motion to adjourn: Meister. Second: O'Tool. Carried 5-0. Meeting concluded at 7:28.

**Minutes - Woodbury County Zoning Commission Meeting – June 26, 2023**

The Zoning Commission (ZC) meeting convened on the 26<sup>th</sup> of June at 6:00 PM in the 1<sup>st</sup> Floor Board of Supervisor's Meeting Room, in the Woodbury County Courthouse. The meeting was also made available via teleconference.

ZC Members Present: Chris Zant, Corey Meister, Tom Bride, Barb Parker  
 County Staff Present: Dan Priestley, Dawn Norton  
 Public Present: Gayle Palmquist, Leo Jochum  
 Phone: Thomas Trehame

**Call to Order**

Chair Chris Zant formally called the meeting to order at 6:00 PM.

**Public Comment on Matters Not on the Agenda**

None

**Approval of Previous Meeting Minutes – May 22, 2023**

Bride motioned. Second: Parker. Motion carried: 4-0.

**Public Hearing: Proposed Zoning Ordinance Text Amendment Concerning Temporary Heavy Construction Services:**

Priestley read into record the summary of proposed Zoning Ordinance Text amendments: An ordinance amending the text of the Woodbury County Zoning ordinance to amend portions of section 3.03.4 entitled: Land Use Summary Table of allowed uses in each zoning district. The proposal is to repeal the "prohibited uses" for "aggregate crush & screen (temporary)," "asphalt mixing (temporary)," and "concrete mixing (temporary)," in the General Commercial (GC) zoning district and the Highway Commercial (HC) zoning district and replace with "Conditional Uses" for "aggregate crush & screen (temporary)," "asphalt mixing (temporary)," and "concrete mixing (temporary)," in both the GC and HC zoning districts.

CURRENT								
LAND USE SUMMARY TABLE OF ALLOWED USES (Section 3.03.4 of the Woodbury County Zoning Ordinance) - EXCERPT								
ok Principal allowed use C Conditional use A Accessory use TU Temporary use – Prohibited use	AP	AE	NR	SR	GC	HC	LI	GI
Temporary heavy construction services								
Aggregate crush & screen (temporary)	C	--	--	--	--	--	C	C
Asphalt mixing (temporary)	C	--	--	--	--	--	C	C
Concrete mixing (temporary)	C	--	--	--	--	--	C	C

PROPOSED								
LAND USE SUMMARY TABLE OF ALLOWED USES (Section 3.03.4 of the Woodbury County Zoning Ordinance) - EXCERPT								
ok Principal allowed use C Conditional use A Accessory use TU Temporary use – Prohibited use	AP	AE	NR	SR	GC	HC	LI	GI
Temporary heavy construction services								
Aggregate crush & screen (temporary)	C	--	--	--	C	C	C	C
Asphalt mixing (temporary)	C	--	--	--	C	C	C	C
Concrete mixing (temporary)	C	--	--	--	C	C	C	C

DRAFT PROPOSAL  
LANGUAGE – SUBJECT  
TO CHANGES

ORDINANCE NO. \_\_\_\_\_

WOODBURY COUNTY, IOWA

AN ORDINANCE AMENDING THE TEXT OF THE WOODBURY COUNTY ZONING ORDINANCE TO AMEND PORTIONS OF SECTION 3.03.4 ENTITLED: *LAND USE SUMMARY TABLE OF ALLOWED USES IN EACH ZONING DISTRICT*.

NOW, THEREFORE, BE IT ENACTED BY THE BOARD OF SUPERVISORS OF WOODBURY COUNTY, IOWA THAT THE BELOW ZONING ORDINANCE LANGUAGE AMENDMENTS BE MADE:

**Amendment #1 –**

On page 37: To modify the following uses within multiple zoning districts in the zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the "Temporary heavy construction services" category as follows:

To repeal and replace the following uses: *Aggregate crush & screen (temporary)* "Prohibited use" represented as "--" in the "GC" (General Commercial Zoning District) column and in the "HC" (Highway Commercial Zoning District) column with a "Conditional use" represented with a "C" to be placed in both the "GC" (General Commercial Zoning District) and "HC" (Highway Commercial Zoning District) columns.

**Amendment #2 –**

On page 37: To modify the following uses within multiple zoning districts in the zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the "Temporary heavy construction services" category as follows:

To repeal and replace the following uses: *Asphalt mixing (temporary)* "Prohibited use" represented as "--" in the "GC" (General Commercial Zoning District) column and in the "HC" (Highway Commercial Zoning District) column with a "Conditional use" represented with a "C" to be placed in both the "GC" (General Commercial Zoning District) and "HC" (Highway Commercial Zoning District) columns.

**Amendment #3 –**

On page 37: To modify the following uses within multiple zoning districts in the zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the "Temporary heavy construction services" category as follows:

To repeal and replace the following uses: *Concrete mixing (temporary)* "Prohibited use" represented as "--" in the "GC" (General Commercial Zoning District) column and in the "HC" (Highway Commercial Zoning District) column with a "Conditional use" represented with a "C" to be placed in both the "GC" (General Commercial Zoning District) and "HC" (Highway Commercial Zoning District) columns.

THE WOODBURY COUNTY BOARD OF SUPERVISORS

\_\_\_\_\_  
Matthew Ung, Chairman

\_\_\_\_\_  
Jeremy Taylor, Vice-Chairman

\_\_\_\_\_  
Daniel Bittinger II

Attest:

\_\_\_\_\_  
Mark Nelson

\_\_\_\_\_  
Patrick Gill, Woodbury County Auditor

\_\_\_\_\_  
Keith Radig

Adoption Timeline:

Date of Public Hearing and First Reading \_\_\_\_\_

Date of Public Hearing and Second Reading \_\_\_\_\_

Date of Public Hearing and Third Reading \_\_\_\_\_

Date of Adoption \_\_\_\_\_

Published/Effective Date \_\_\_\_\_



Motion to close public hearing: Meister. Second: Parker. Carried: 4-0. Bride motioned to approve amendments included in the draft proposal. Second: Meister. Motion approved: 4-0.

**Information/Discussion: Update on Zoning Commission May 22, 2023 Recommendation For Solar Energy Systems Amendments Proposal to Woodbury County Zoning Ordinance. Summary of Proposed Zoning Ordinance Text Amendments:**

As directed by the Woodbury Zoning Commission on Monday, May 22, 2023, the Woodbury County Attorney's office worked with staff to review/revise the language in the draft ordinance amendments concerning solar to account for net metering opportunities prior to this language being sent to the Board of Supervisors (BoS) for up to three (3) public hearings. This is being brought back to the Zoning Commission as an "Information / Discussion" item to update the Commission and the public about the revisions. The public hearing dates before the Board of Supervisors are yet to be determined.

**Information/Discussion: Meeting Time and Location for the Woodbury County Zoning Commission as Referenced in the Rules of Procedure.**

Discussion of changing Zoning Commission meeting time. The commissioners presented were open to 5:00 pm as a potential start time. Any change would require a vote of the commission to change the rules of procedures. Additionally, it would require an affirmative vote by the Board of Supervisors.

**Public Comment on Matters not on the Agenda:**

Gayle Palmquist spoke on carbon pipelines.

**Commissioner Comment or Inquiry:**

None

**Staff Update:**

Priestley stated that the Board of Supervisors public hearings on the proposed Zoning Ordinance Text Amendment concerning Temporary Heavy Construction Services will be July 11, 18, and 25. The board has the authority to waive the 2<sup>nd</sup> and 3<sup>rd</sup> readings.

Motion to adjourn: Meister. Second: Parker. Carried 4-0. Meeting concluded at 6:34 pm.

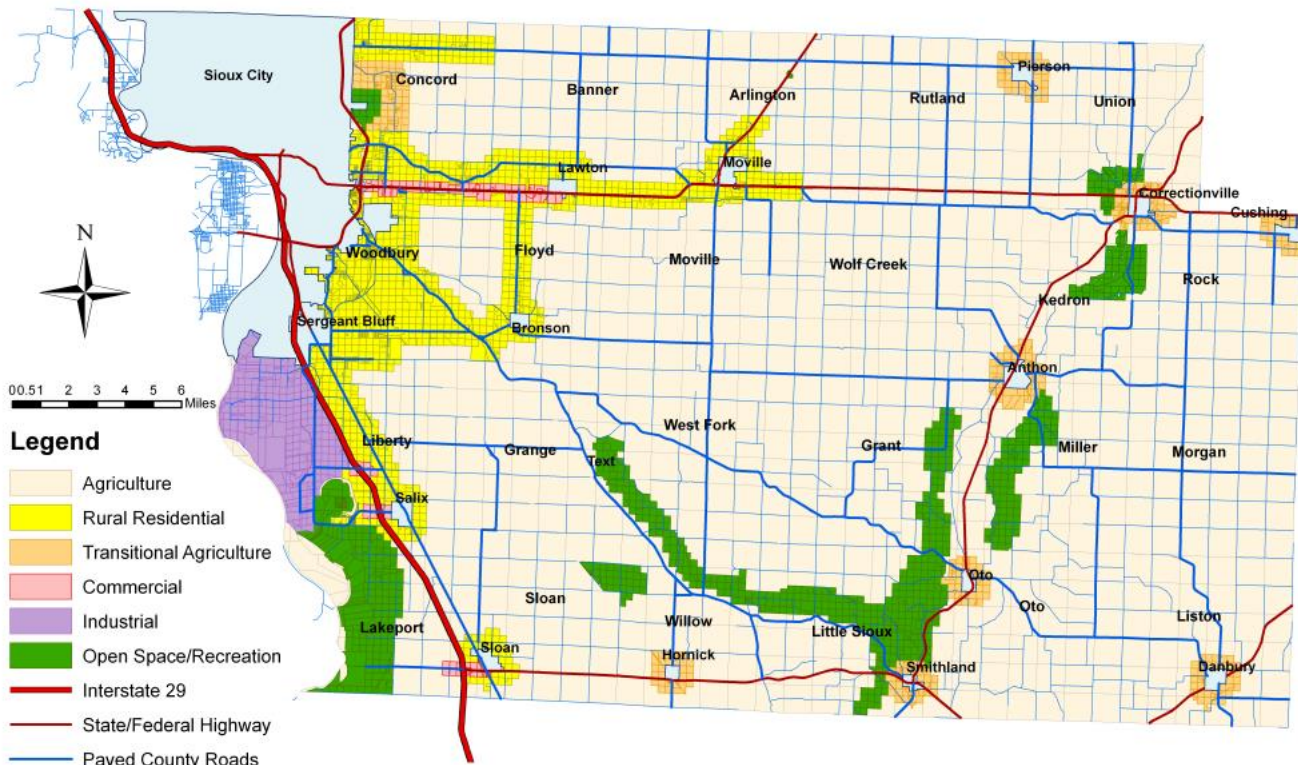
## STAFF ANALYSIS - CURRENT ZONING FOR SOLAR

Solar energy generation can be classified into two categories including personal or private and utility scale systems. The permitting or allowed use of solar panels in Woodbury County is three-fold. **First**, utility solar scale systems are only allowed for consideration as a conditional use in the General Industrial (GI) Zoning District. They are prohibited in all of the other zoning classifications. **Second**, personal or private systems are considered in each zoning district via the conditional use permit process. Lastly, it is possible that the Agricultural Exemption in Iowa Code 335.2 could be invoked for farms to utilize solar energy when it is primarily adapted and used for agricultural purposes.

As noted, the Woodbury County Zoning Ordinance prohibits commercial **large-scale electrical energy generation (not including wind)** in each zoning district except for General Industrial (GI). Within the GI Zoning District, a conditional use permit application is required to be reviewed by the Zoning Commission and considered for approval by the Board of Adjustment. Under this policy, utility scale solar panel systems are prohibited on farmland (and all districts except GI) unless a farming operation uses them under the parameters of the agricultural exemption as enumerated in Iowa Code 335.2.

Under the existing regulations, if a landowner desires to use several acres of land in the Agricultural Preservation (AP) Zoning District to sell back to the grid as a utility scale solar farm, they would first need to achieve a rezone from the AP to the GI Zoning District. However, since spot zoning by convention is not a widely accepted practice, and that much of the future land use map does not provide for industrial activities in agricultural areas (see Future Land Use Map below), the chances are minimal for the zoning designation to change in order to consider a commercial solar conditional use permit on AP zoned land.

## Future Land Use Map



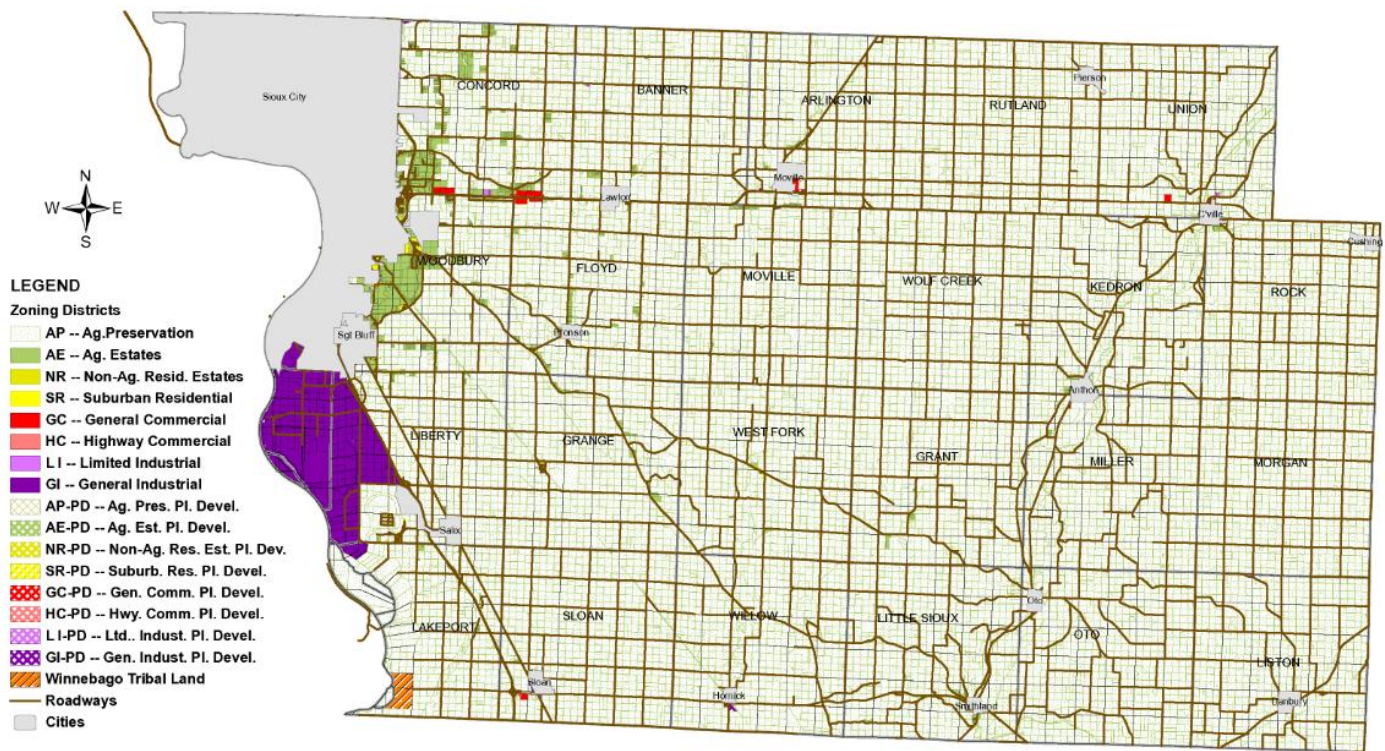
### Planning for 2025

## The Woodbury County General Development Plan

Adopted November 22, 2005



# Zoning Map of Woodbury County, Iowa



Adopted July 22, 2008

Woodbury County Zoning Map

**Residential solar panels** are not referenced in the ordinance. However, it has been an interpretation under Section 3.03 (see excerpt below) that electric wind generation (private use) is the most comparable use to solar panels for private use.

- 3. Interpretation and updating.** The listing of uses in the table in subsection 3.03-4 is intended to be comprehensive; however, it is certain to be incomplete due to omissions or new uses that will be developed in the future. The zoning director shall interpret which uses found in the Land Use Summary Table are comparable to an unlisted use or which zoning districts are appropriate for such use to be allowed as either principal allowed, conditional or accessory uses. The table in subsection 3.03-4 may be updated pursuant to the procedure outlined in Section 2.03 from time to time to reflect legislative acceptance or rejection of the interpretations of the zoning director.

1 - Excerpt from Woodbury County's Zoning Ordinance (p. 39).

[https://www.woodburycountyiowa.gov/files/community\\_economic\\_development/zoning\\_ordinance\\_86604.pdf](https://www.woodburycountyiowa.gov/files/community_economic_development/zoning_ordinance_86604.pdf)

Therefore, in order to have residential solar panels as an accessory structure in the unincorporated areas, residents must go through the conditional use permit process which would entail review by the Zoning Commission and consideration for approval by the Zoning Commission.

ok Principal allowed use C Conditional use A Accessory use TU Temporary use -- Prohibited use	AP	AE	NR	SR	GC	HC	LI	GI
Utilities								
Electrical energy generation (not incl. wind)	--	--	--	--	--	--	--	C
Electrical energy wind generation (Commercial)	C	--	--	--	--	--	--	C
Sewage treatment plants	C	C	C	C	C	C	C	C
Utility substations	ok	ok	--	--	ok	--	--	ok
Electric wind generator (Private use)	C	C	C	C	C	C	C	C
Sewage treatment for subdivision	C	C	C	C	C	C	C	C
Sewage lagoon	C	C	C	C	C	C	C	C
Water storage tanks	C	C	C	C	C	C	C	C

2 - Excerpt from Woodbury County's Zoning Ordinance (p. 39).

[https://www.woodburycountyiowa.gov/files/community\\_economic\\_development/zoning\\_ordinance\\_86604.pdf](https://www.woodburycountyiowa.gov/files/community_economic_development/zoning_ordinance_86604.pdf)

## DEVELOPMENT PLAN AND ZONING ORDINANCE

The Woodbury County General Development Plan from 2005 offers goals and policies based the following vision:

*Where, sharing a strong sense of community, good people live freely without fear or want;  
Where all people and businesses prosper, rooted in a diverse agriculturally-based economy;  
Where stewardship of natural resources is a matter of individual and community pride and ownership;  
Where government exists to serve people and to protect the public health, safety and welfare.*

The broad goals derived from this statement include: land use; economic development; agricultural; commercial and industrial business; residential; parks and recreation; conservation and environmental; facilities and operations; public safety; and transportation. Thus, each possesses a set of priorities that must be prudently balanced when considering future land use measures.

In terms of land use, the plan calls for growth through stable development. Land Use Goal 1.1 states “adopt a land use plan that designates areas for anticipated future population and business growth needs of the county” (Woodbury County General Development Plan, 2005, p. 18). Land Use Goal 1.2 states “adopt development regulations (i.e. zoning and subdivision regulations) that promote efficient, stable land uses with minimum conflicts and provision of public infrastructure” (Development, 2005, p. 18). Thus, the intent for stable development is through the use of zoning districts which designates locations as to whether a particular use is acceptable or not. The Woodbury County Zoning Ordinance, as adopted in 2008, classified electrical energy generation as an industrial use and placed it within the GI Zoning District and omitted its use from the other districts.

Both the development plan and the zoning ordinance offer support for renewable energy access. In particular, the plan's Economic Development Goal 2.5 is to “fully explore alternative renewable energy sources, particularly wind generation facilities both as a contribution to the total energy needs of the county and as a new source of income for property owners” (Development, 2005, p. 19). Section 1.02.2(J) of the zoning ordinance indicates “promoting conservation of energy resources and reasonable access to solar energy” (Woodbury County Zoning Ordinance, p. 1).

It is apparent that renewable technology has evolved since 2008. Therefore, it is the intention of this report to evaluate whether or not it is necessary to re-examine both residential and commercial use of renewable solar technology.

## POSSIBLE OPTIONS

Based on Sioux City and other county's policies – see next section, there is a clear difference between solar panels to power a house, business, or industrial facility as an accessory structure (private) versus a commercial electrical generation enterprise (utility scale). Sioux City's designation of solar as an on-premises accessory asset is less restrictive than the current Woodbury County policy. However, the task at hand is to evaluate whether the county should reflect Sioux City's policy for accessory solar as well as evaluate whether additional zoning districts could be considered for utility scale solar beyond the GI Zoning District.

Based on research of other communities, it appears that the Conditional Use Permit or Special Use Permit process is used for Utility Scale Commercial Solar Energy Systems in places such as Clinton, Dubuque, Johnson, Louisa, Monona, and Story Counties. However, the top difference between Woodbury and other jurisdictions is to whether utility scale solar should be allowed for consideration in agricultural districts. In terms of accessory private or personal use to power an individual property, solar panels are permitted as accessory structures in places such as Sioux City, Clinton, Johnson, Linn, Louisa, Monona, and Polk Counties.

### Accessory Solar (Residential, Commercial, and Industrial)

- Summary: Establish stand-alone ordinance, amend existing ordinance, or keep the same policy.
- On page 39, add “Social Energy Generation (Private use)” under the “Utilities” category. Then for each Zoning District category including AP, AE, NR, SR, GC, HC, LI, and GI, add the letter “A” to each column as an “Accessory Use.”
  - o This would enable property owners to add solar panels as accessory structures via the building permit process where they must meet the “Zoning District Dimensional Standards.”
  - o This would also require for each property to already have an existing primary or principal use (e.g. – Single-Family Dwelling, Commercial Business, Industrial Facility, etc.). The solar panels system would be accessory to a primary use.
- Accessory to support a farm – AG Exempt

### Commercial Solar

- Summary: Establish stand-alone ordinance, amend existing ordinance, or keep the same policy.
- Keep the ordinance exactly the same and commercial solar restricted to “General Industrial” areas only.
  - o Requires rezone to GI and approval of CUP.
  - o Example Projects: MidAmerican Energy (Parcel #874720300006)
    - Zoning Commission Review: September 28, 2020
    - Board of Adjustment Approval: October 5, 2020
- Amend the ordinance to establish “Conditional Use” permit opportunities for commercial solar systems in additional zoning districts such as AP or other districts.
- Explore the concept/feasibility of a Planned Development Overlay Zoning District.



## CITY OF SIOUX CITY SOLAR REGULATIONS - EXCERPTS

The City of Sioux City, the largest incorporated community in Woodbury County allows for solar panels as accessory structures in residential, commercial, and industrial areas. However, they do not have language for a standalone or principal use. Landowners in dense areas are allowed to install solar arrays as accessory structures as long as there is an appropriate principal use. Below are excerpts/references to residential solar in Sioux City's code.

The full Sioux City Code of Ordinances is available at the following link:

<https://online.encodeplus.com/regs/siouxcity-ia/doc-viewer.aspx#secid-4364>

### TITLE 25 ZONING AND SIGN CODE

#### Contents:

#### CHAPTER 25.03 DEVELOPMENT STANDARDS

#### SUBCHAPTER 25.03-B ACCESSORY AND SUPPLEMENTAL STANDARDS

#### Sec. 25.03.080 All Uses

##### Subsection 25.03.080.4 Solar Arrays

1. **Generally.** Solar arrays are allowed as provided in this Item.
2. **Exemption.** Solar arrays and energy storage units are exempt from the requirement of obtaining a certificate of occupancy, as set out in Subsection [237](#), *Certificate of Occupancy*.
3. **Height and Area Exceptions.** Solar arrays and their condensers and energy storage units may exceed the height limit and encroach into the required yards of the district in which they are located, subject to the standards and limitations set out in Section [603](#), *Height and Area Exceptions*.
4. **Standards.** The following standards apply to all solar arrays:
  - a. *Roof-Mounts.* Solar arrays may be roof-mounted on principal buildings and accessory buildings.
  - b. *Ground-Mounts.* Ground- or structure-mounted (not mounted on buildings) solar arrays shall be set back from property lines distances equal to that of detached accessory buildings, subject to the encroachment allowances set out in Section [603](#), *Height and Area Exceptions*.
  - c. *Carports*

### TITLE 25 ZONING AND SIGN CODE

#### Contents:

#### CHAPTER 25.07 DEFINITIONS

#### SUBCHAPTER 25.07-B DEFINITIONS

#### S

**Solar Array** (also called "photovoltaic arrays" or "PV arrays") means an array of solar cells that convert energy from sunlight directly to electricity.

### TITLE 25 ZONING AND SIGN CODE

#### Contents:

#### CHAPTER 25.07 DEFINITIONS

#### SUBCHAPTER 25.07-B DEFINITIONS

#### S

**Solar Access Easement** means a right expressed as an easement, covenant, condition, or other property interest in any deed or other instrument executed by or on behalf of and landowner, which protects the solar access of an actual, proposed, or designated solar energy collector at a described location by forbidding or limiting activities or land uses that interfere with access to solar energy.

### TITLE 25 ZONING AND SIGN CODE

#### Contents:

#### CHAPTER 25.03 DEVELOPMENT STANDARDS

#### SUBCHAPTER 25.03-A DEVELOPMENT YIELD AND LOT STANDARDS

#### Sec. 25.03.050 Height and Area Exceptions

##### Subsection 25.03.050.1 Residential Districts

1. **Agriculture (AG), Rural Residential (RR), Suburban Residential (SR), General Residential (GR), Urban Residential (UR), Neighborhood Conservation (NC), and residential uses in the Mixed Use (MU) and Suburban Commercial (SC) Districts.**
  - a. *Height Exceptions.*
    1. Any structure, principal use, or building erected or altered after the effective date of this Code shall comply with the height limitations of the district in which it is located, except as specified in this Item. However, in no case shall the exceptions listed below exceed the maximum height restrictions of the Airport Protection (AP) district, as set out in Subsection [25.02.060.1](#), *Airport Protection (AP) Overlay District*.
    2. The appurtenances listed below may exceed the prescribed height limit of the district in which they are located, provided they are normally required for a use permitted in the

district in which they are erected or constructed. However, no appurtenance shall appreciably shade a solar array located on the same or any adjoining property.

- A. Belfries;
- B. Chimneys;
- C. Condensers;
- D. Cooling towers;
- E. Cupolas, domes, and spires;
- F. Elevator bulkheads;
- G. Flagpoles;
- H. Monuments;
- I. Observation or ornamental towers;
- J. Penthouses for other than living purposes;
- K. Solar arrays, collectors, condensers, and heat storage units, subject to the standards set out in Subsection 25.03.080.4, *Solar Arrays*.
- L. Stacks; and
- M. Standpipes and other necessary mechanical appurtenances and their protective housing.

b. *Lot Area Exceptions.* See Subsection 25.06.120.7, *Nonconforming Lots*.

c. *Yards.* Any building, structure, or principal use erected, altered, or established shall comply with the yard requirements of the district in which it is located, as set out in Subsection 25.03.020.3, *Development Standards* (for Established Neighborhoods) or Subsection 25.03.030.1, *Development Standards* (for New Neighborhoods), except as specified in this Item.

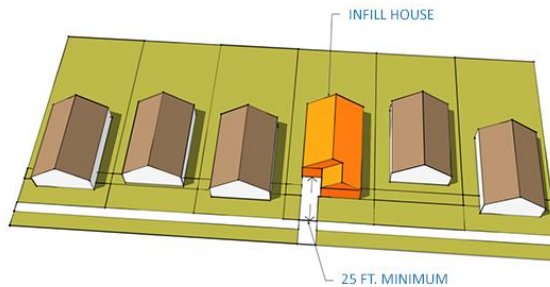
- 1. The required yards for any building, structure, or use shall be contained on the same lot and in the same district as the building, structure, or use for which it is required.
- 2. All required yards shall be open from the ground to the sky, except as specified in this Item.

d. *Yard Encroachments.*

- 1. Eaves and cornices may extend no more than two feet into a required yard, except that eaves may encroach up to three feet into a required yard when such yard is 10 feet or more in width or depth. In the case of lot line homes, eaves and cornices shall either extend into a required yard or an access easement on the adjoining lot.
- 2. Chimneys, when not more than four feet wide, may extend one foot into any required interior side yard or street side yard. Such chimneys may extend two feet into any yard when such yard is 10 feet or more in width or depth. Chimneys of more than four feet in width must conform to the yard requirements.
- 3. Open, uncovered porches or terraces.
  - A. Porches and terraces that are no higher than the floor level of the first floor above grade on the side of the building to which they are attached, and in no event higher than 30 inches above grade of the lot on the side of the building where such porch or terrace is located, may extend:
    - I. Three feet into any required side yard, provided it is not closer than three feet to a side lot line;
    - II. Ten feet into any required front yard, provided it is not closer than eight feet to the front property line; or
    - III. Within no less than five feet of the rear lot line.
  - B. No railing or other barrier that is higher than 42 inches shall be placed around a porch or terrace and no solid wall or barrier which blocks light or air shall be within five feet of any property line, except as otherwise provided in this Item.
  - C. All porches and terraces shall be subject to street corner visibility requirements, as set out in Subsection 25.04.110.8, *Sight Distance Requirements* (Reserved), or as otherwise required by the City.
- 4. Air-conditioning condensers may extend four feet into a required yard, provided the condenser is no more than three feet in height and 30 cubic feet in bulk.
- 5. Solar energy collectors and heat storage units of up to 200 square feet of collector surface area may extend two feet into any required yard of 10 feet or more. A solar energy collector and heat storage unit of any size needed to supply the building to which it is appurtenant may be treated as an accessory use, subject to the provisions of Subchapter 25.03-B, *Accessory and Supplemental Standards*, and established according to the provisions set out in Section 25.02.280, *Permitted Accessory Uses, Buildings, and Structures*.

e. *Fences and Hedges.*

1. Except in districts allowing the construction of buildings to the property line, there shall be provided an unobstructed view within the sight distance triangle, or as otherwise required by the City, within which there shall be no sight-obscuring or partly obscuring wall, fence, sign, or foliage that is more than 24 inches above curb grade or, in the case of trees, foliage that is lower than 10 feet above curb grade.
  2. On portions of a lot not within the sight distance triangle, the height of fences of any length, and foliage continuous for five feet or more, shall be limited to 48 inches on any street right-of-way and ahead of the front building line. On all other portions of lot lines, fences, hedges, and continuous foliage barriers may not exceed the standards set out in Subsection [25.03.090.3](#) *Fences and Walls*. However, a non-opaque fence may be placed around the grounds of a public or private school that may be up to 96 inches in height.
  3. Fences and hedges erected within the building envelope may conform with the building height limits for the district in which it is located, subject to all applicable building codes, as amended from time to time.
- f. *Exception.* The Board of Adjustment may approve, or may direct as a condition for granting an appeal, that fences or hedges of a height in excess of those established in this Item be placed as buffering between uses, provided that no such approval shall have the effect of reducing sight visibility.
- g. *Platted Building and Setback Lines.* If a recorded subdivision plat imposes a building or setback line for a lot which is greater than the minimum yards required in this Code, then, notwithstanding any other provision of this Code, the minimum yards shall be the greater of those shown on the subdivision plat or those set out in Subsection [25.03.020.3](#), *Development Standards* (for Established Neighborhoods) or Subsection [25.03.030.1](#), *Development Standards* (for New Neighborhoods).
- h. *Minor Modifications.* The yard, space, and bulk regulations specified in this Code may include consideration of minor modifications that may be authorized by the Administrator, or a designee, as set out in Subsection [25.06.150.2](#), *Repairs and Modifications*.
- i. *Average Front Setbacks.* Front setbacks may be reduced to the average front setback along the same side of the same street segment in the same district, provided that:
1. The lot proposed for development is not counted in the calculation; and
  2. If the lot takes vehicular access from the front, the driveway must be at least:
    - A. 25 feet long, measured from the property line at the street right-of-way to a building wall or garage door; and
    - B. The width of the garage door(s) are not more than 18 feet or less than nine feet in width. (See Figure [25.03.050.1](#), *Front Setback Averaging*)



(Ord. 2016-0177; 2015-0433; 2015-0215)  
Effective on: 6/13/2015

Source: <https://online.encodeplus.com/regs/siouxcity-ia/doc-viewer.aspx#secid-4364>

Clinton County 46,734 Pop

## EXAMPLE SOLAR ORDINANCE

4. **Engineer Certification:** Applications for NonC-WECS shall be accompanied by standard drawings of the wind turbine structure, including the tower, base, and footings. An engineering analysis of the tower showing compliance with the applicable regulations and certified by a licensed professional engineer shall also be submitted. This analysis is frequently supplied by the manufacturer.
5. **Compliance with FAA Regulations:** NonC-WECS must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.
6. **Compliance with National Electric Code:** Applications for NonC-WECS shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code. This information is frequently supplied by the manufacturer.
7. **Utility Notification:** No NonC-WECS shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

**4.2.18 Utility Scale Solar Installations.** (Amended 10/3/16-Ord 2016-03)

The Purpose of this section is to encourage utility scale photovoltaic solar installations. Concentrating solar power (CSP) systems shall be prohibited.

- A. **Major site plan and Special Exception Use Permit required:** A site plan shall be submitted and reviewed as part of the approval of a utility scale solar installation. A utility scale solar installation shall require a Special Exception Use Permit.
- B. **Additional information:** In addition to all submittal requirements of a Special Exception Use Permit application, the application for a utility scale solar installation shall include the following information on the site plan or in narrative form, supplied by the utility scale solar installation owner, operator or contractor installing the structure(s):
  1. Number, location and spacing of solar panels/arrays.
  2. Planned location of underground or overhead electric lines.
  3. Project development timeline.
  4. Interconnection agreement.
  5. Operation and maintenance plan.
  6. Decommissioning plan.
- C. **Site and Structure Requirements**
  1. **Setback.** Setbacks for all structures (including solar arrays) must adhere to

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the minimum principal setback standards for the zoning district where the project is located; greater setbacks may be required by the Board of Adjustment.

2. **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 by the Board of Adjustment as part of the review and approval process and will be based on adjacent or nearby surrounding land uses and topography.
3. **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.
4. **Grading plan.** A grading plan shall be submitted and shall include all proposed changes to the landscape of the site (e.g., clearing, grading, topographic changes, tree removal, etc.).
5. **Glare minimization.** All solar panels must be constructed to minimize glare or reflection onto adjacent properties and adjacent roadways and must not interfere with traffic, including air traffic, or create a safety hazard.
6. **Compliance with local, state and federal regulations.** Utility scale solar installations shall comply with applicable local, state and federal regulations.
7. **Appurtenant structures.** All appurtenant structures shall be subject to bulk and height regulations of structures in the underlying zoning district.
8. **Floodplain considerations.** Utility scale solar installations are considered to be maximum damage potential structures and facilities for purposes of the floodplain district regulations.
9. **Signage.** No signs other than appropriate warning signs, or standard manufacturer's, operator's or installer's identification signage, shall be displayed.
10. **Fencing/security.** A security fence must be installed along all exterior sides of the utility scale solar installation and be equipped with a minimum of one gate and locking mechanism on the primary access side. 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.

D. **Operation and maintenance plan.** 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.

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1. **Soil erosion and sediment control considerations.** The applicant agrees to conduct all roadwork and other site development work in compliance with a National Pollutant Discharge Elimination System (NPDES) permit as required by the Iowa Department of Natural Resources and comply with requirements as detailed by local jurisdictional authorities during the plan submittal. If subject to NPDES requirements, the applicant must submit the permit for review and comment, and an erosion and sediment control plan before beginning construction. The plan must include both general "best management practices" for temporary erosion and sediment control both during and after construction and permanent drainage and erosion control measures to prevent damage to local roads or adjacent areas and to prevent sediment laden runoff into waterways.
2. **Stormwater management considerations.** For the purposes of pollutant removal, stormwater rate and runoff management, flood reduction and associated impacts, the applicant shall provide a detailed analysis of pre- and post-development stormwater runoff rates for review by local jurisdictional authorities.
3. **Ground cover and buffer areas.** Ground around and under solar arrays and in project site buffer areas shall be planted and maintained in perennial vegetated ground 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 run off 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 buffer areas as appropriate for visual screening.
  - c. Seed mixes and maintenance practices should be consistent with recommendations made by qualified natural resource professionals such as those from the Department of Natural Resources, County Soil and Water Conservation Service, or Natural Resource Conservation Service.
4. **Cleaning chemicals and solvents.** During operation of the proposed installation, all chemicals or solvents used to clean photovoltaic panels should be low in volatile organic compounds and the operator should use recyclable or biodegradable products to the extent possible. Any onsite storage of chemicals or solvents shall be referenced.
5. **Maintenance, repair or replacement of facility.** Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to emergency response officials. Any retrofit, replacement or refurbishment of equipment

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shall adhere to all applicable local, state and federal requirements.

**E. Decommissioning and site reclamation plan.**

1. The application must include a decommissioning plan that describes: the anticipated life of the utility scale 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:
  - a. Restoration of the pre-construction surface grade and soil profile after removal of structures, equipment, graded areas and access roads.
  - b. Re-vegetation of restored soil areas with crops, native seed mixes, plant species suitable to the area, consistent with the county's weed control plan.
  - c. For any part of the energy project 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 use of remaining structures must be in conformance with the regulations in effect at that time.
4. Following a continuous 1 year period in which no electricity is generated, or if substantial action on the project is discontinued for a period of 1 year, the permit holder will have 1 year to complete decommissioning of the utility scale solar installation. Decommissioning shall be completed in accordance with the approved decommissioning plan. The land owner or tenant must notify the County when the project is discontinued.

**4.2.19 Non-Utility Scale Solar Installations** (Amended 10/3/16-Ord 2016-03)

A. **Permitted Accessory Use.** Active solar energy systems shall be allowed as an accessory use in all zoning classifications where structures of any sort are allowed, subject to certain requirements as set forth below.

1. **Height.** Active solar energy systems must meet the following height requirements:
  - a. Building- or roof-mounted solar energy systems shall not exceed the maximum allowed height in any zoning district. For

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<p>purposes for height measurement, solar energy systems other than building-integrated systems shall be given an equivalent exception to height standards as building mounted mechanical devices or equipment.</p> <p>b. Ground- or pole-mounted solar energy systems shall not exceed 20 feet in height when oriented at maximum tilt.</p> <p>2. <b>Set Back.</b> Active solar energy systems must meet the accessory structure setback for the zoning district and primary land use associated with the lot on which the system is located.</p> <p>a. Roof-mounted solar energy systems. In addition to the building setback, the collector surface and mounting devices for roof-mounted solar energy systems shall not extend beyond the exterior perimeter of the building on which the system is mounted or built, unless the collector and mounting system has been explicitly engineered to safely extend beyond the edge, and setback standards are not violated. Exterior piping for solar hot water systems shall be allowed to extend beyond the perimeter of the building on a side yard exposure.</p> <p>b. Ground-mounted solar energy systems. Ground-mounted solar energy systems may not extend into the side-yard or rear setback when oriented at minimum design tilt.</p> <p>3. <b>Approved Solar Components.</b> Electric solar energy system components must have a UL listing and solar hot water systems must have an SRCC rating.</p> <p>4. <b>Approval Required.</b> All solar energy systems shall require a Zoning Permit from the Clinton County Planning and Zoning office. Zoning approval does not indicate compliance with Building Code or Electric Code.</p> <p>5. <b>Compliance with Building Code.</b> All active solar energy systems shall be consistent with the State of Iowa Building Code and solar thermal systems shall comply with HVAC-related requirements of the Electric Code.</p> <p>6. <b>Compliance with State Electric Code.</b> All photovoltaic systems shall comply with the Iowa State Electric Code.</p> <p>7. <b>Compliance with State Plumbing Code.</b> Solar thermal systems shall comply with applicable Iowa State Plumbing Code requirements.</p> <p>8. <b>Utility Notification.</b> All grid connected solar energy systems shall comply with the interconnection requirements of the electric utility. Off-grid systems are exempt from this requirement.</p> <p>February 17, 1999 #30826v9</p> <p>Page 89</p>	
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Source: [https://www.clintoncounty-ia.gov/files/county\\_ordinances/chapter0\\_zoning\\_ordinance.pdf](https://www.clintoncounty-ia.gov/files/county_ordinances/chapter0_zoning_ordinance.pdf)

## JOHNSON COUNTY IOWA SOLAR REGULATIONS - EXCERPTS

193. **Solar Array.** Equipment used for private or utility scale solar energy systems. Can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure.
194. **Solar Energy Systems, Private.** An energy system that converts solar energy to usable thermal, mechanical, chemical, or electrical energy for immediate onsite use and/or storage or to be fed back to the electrical grid. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure.
195. **Solar Energy Systems, Utility Scale.** An energy system, commonly referred to as a “solar farm”, which converts solar energy to usable thermal, mechanical, chemical, or electrical energy for transmission through the electrical grid for offsite use or wholesale and/or retail sale. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure. Utility scale solar energy systems do not include concentrating solar power (CSP) systems.
199. **Structure.** Anything constructed or erected on the ground or attached to the ground, including, but not limited to, buildings, signs, fences, retaining walls, solar arrays, swimming pools, and storage tanks.

### 8:1.6 A – Agricultural Zoning District.

The Agricultural Zoning District is intended to preserve valuable agricultural amenities and to provide land for all types of agricultural production. The Agricultural district is also intended for those agricultural uses that do not qualify for agricultural exemption under subsection 8:1.3.

**A. Primary Uses.** The following primary uses are allowed in the A district. Multiple primary uses are allowed on parcels in the A district and all uses may be subject to supplemental conditions found in subsection 8:1.23.

1. Agricultural Uses.
2. Animal Husbandry. Limited to those standards in subsection 8:1.23.
3. Agricultural Domiciles, as established in accordance with section 8:1.3
4. Agricultural Outbuildings.
5. Stables, Riding Academies, and Clubs.
6. Single Family Dwellings and Manufactured Homes. Limited to those standards in subsection 8:1.6(M).
7. Farmstead Splits. Limited to those standards in subsection 8:1.6(L).
8. Solar Energy Systems, Private.

Source:

<https://www.johnsoncountyiowa.gov/sites/default/files/2020-08/Johnson%20County%20UDO%20%282020%20ed%29-%20adopted%2012.19.19.pdf>

# LINN COUNTY IOWA SOLAR CHECKLIST



Planning & Development  
Linn County, IA

Building Division

Linn County Building Code  
Residential Guidelines

Photovoltaic Installation  
Plan Review Checklist  
Page 1 of 2

## Linn County Planning and Development Photovoltaic Installation Plan Review Checklist

Within three (3) business days, Planning & Development Department staff will endeavor to review all photovoltaic solar array permits under 15 kW in size, and contact the applicant with approval, a request for more information, or rejection. Review of solar array permits over 15kW may take longer than three (3) business days to complete.

In order to process your permit application in an expeditious manner you must provide all required information regarding your proposal. *Incomplete applications will take significantly longer to process.* If you have questions please contact us using the information provided at the bottom of this sheet.

### The following information will be required:

- ☐ A Building Permit Application and an Electrical Permit Application
- ☐ The installing contractor name, license type, and number
- ☐ An application fee (required with all applications and also serves as the price of the permit)

### A complete application for a solar PV system will include:

- ☐ A permit application with:
  - ☐ The location of the proposed installation
  - ☐ Structural analysis of roof systems with framing member spacing of MORE than 24 inches center to center
  - ☐ Information about the mounting system that will be used to construct the array
  - ☐ Any zoning related information that may impact the installation
- ☐ A to-scale site plan showing:
  - ☐ Equipment locations
  - ☐ Types of panels and inverters
  - ☐ Types and sizes of conduits and conductors
  - ☐ Lengths of runs
  - ☐ A grounding diagram showing electrodes and grounding electrode conductors

- ☐ A wiring diagram showing
  - ☐ All circuitry
  - ☐ Equipment
  - ☐ Fusing
  - ☐ Points of connection
  - ☐ Disconnects
  - ☐ Array wiring
  - ☐ Equipment grounding
- ☐ Cut sheets and instruction manual for the inverter with the applicable model numbers highlighted and the UL or comparable listing noted.
- ☐ Cut sheets for the PV modules, which need to include  $V_{oc}$  rating,  $P_{MAX}$ , maximum series fuse rating, voltage at  $P_{MAX}$  and current at  $P_{MAX}$ .
- ☐ Cut sheets on batteries, if applicable, and connection diagrams with cable sizes.
  - Identify:
    - ☐ Battery fusing and fuse holders
    - ☐ Amp hour of battery bank
    - ☐ Charge capacity of charge system
    - ☐ Details for battery storage and venting
- ☐ Identify wire types and connectors of all cables.
- ☐ Provide details for array mounting and engineering for the supporting structure.
- ☐ Verify the ability of PV system installed on three phase supplied systems to cease to export power on loss of voltage in any phase.
- ☐ Show all warning signs and their locations.

### Ensure that all required materials have been completed and compiled and submit them.

Construction documents are required to be submitted in pdf format. Plans shall include dimension lines or be drawn to scale. Provide sufficient information for the building official to ascertain the scope of the project. Plans shall also allow for digital signatures and mark-ups. Online submittal is preferred. Plans can be submitted via the [Permit Application Portal](#). In-person submittal is available by appointment, call 892-5130 to schedule.

[www.linncounty.org/planning](http://www.linncounty.org/planning)

935 2nd Street SW  
Cedar Rapids, IA 52404  
Phone 319.892.5130  
Fax 319.892.5155  
Revised 7/17/20

Source:

<https://www.linncountyiowa.gov/DocumentCenter/View/5963/Solar-Permitting-Checklist-PDF>

# LOUISA COUNTY IOWA SOLAR PROPOSAL

Louisa County 11,125 Pop

## EXAMPLE SOLAR ORDINANCE

### Proposed Zoning Ordinance Amendment

#### Creation of Division 115: Solar Energy Systems

LOUISA COUNTY IOWA

#### Sections:

- 1.01 Statement of Intent
- 1.02 Personal Solar Energy System (PSES)
- 1.03 Solar Garden and Solar Farm Energy System (SFES)
- 1.04 Indemnification and Liability
- 1.05 Cessation of Operations
- 1.06 Penalties
- 1.07 Solar Energy System Owner/County/Property Owner Restoration Agreement
- 1.08 Related Rules and Regulations
- 1.09 Severability
- 1.10 Special Use Permit Fee Structure

**1.01 Statement of Intent.** The purpose of this Division is to facilitate the construction, installation, and operation of Solar Energy Systems (SES) in Louisa County in a manner that promotes economic development, protects property values, and ensures the protection of health, safety, and welfare while also avoiding adverse impacts to important areas such as agricultural lands, conservation lands, and other sensitive lands.

This Division does not repeal, abrogate, annul, impair or interfere with any existing ordinance.

#### 1.02 Personal Solar Energy System (PSES).

##### A. Purpose and Intent.

The purpose of these regulations is to provide a uniform and comprehensive set of standards for the installation and use of PSESs designed for on-site home, farm and small commercial use that are used primarily to reduce on-site consumption of utility power. The intent of these regulations is to protect the public health, safety, and community welfare without unduly restricting the development of PSESs.

##### B. Permitted Use.

Personal Solar Energy Systems shall be considered an accessory use to a principal permitted use in any zoning district.

#### C. Special Requirements

Personal Solar Energy Systems shall be subject to the requirements included in Zoning Ordinance Section 60.6 Bulk Regulations unless otherwise stated herein:

- 1) **Ground Mounted PSES height.** Shall not be greater than fifteen (15) 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.** The ground mounted PSES shall maintain perimeter setbacks including: side and rear yard setbacks of ten (10) feet measured at full horizontal tilt and shall be ten (10) feet from any other building or structure on the same lot. No PSES shall be permitted to be located in the required front yard setback unless at least sixty (60) feet back from the edge of the county road right of way or at least eighty (80) feet back from the edge of state or federal road right of way.
- 4) **Building Codes.** All county, state, and national construction codes shall be followed.
- 5) **Use.** The PSES shall provide electricity for on-site use by the owner. This does not prohibit an owner from making excess power available for net metering.
- 6) **Approved Solar Components.** Electric solar energy system components must have an Underwriters Laboratory (UL) listing or approved equivalent.

#### D. Building Permit

Before a building permit is issued, the following shall be submitted to the Louisa County Zoning Administrator for review:

- 1) Site plan showing:
  - a) Name, address, email address, and phone number of the property owner;
  - b) Parcel lines;
  - c) All existing structures, with heights clearly marked;
  - d) Sanitary infrastructure (i.e. Septic field);
  - e) Setback measurements;
  - f) easements present on the property, including those for utilities
  - g) field tile location
  - h) floodplain location, if applicable
  - i) topography lines (2-foot contours)

- f) Location of all solar panels and associated equipment; and,
- g) Location of the electrical disconnect for the PFES.

- 2) Evidence that the local electric utility has been informed of the customer's intent to install a customer-owned solar energy system.
- 3) Evidence that the site plan has been submitted to the local fire protection district.

After a review and acceptance of site plan and required information, a letter authorizing construction shall be issued.

### 1.03 Solar Garden Energy System (SGES) and Solar Farm Energy System (SFES)

#### A. Purpose and Intent.

The purpose of these regulations is to provide a uniform and comprehensive set of standards for the installation and use of SGES and 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. Concentrating solar power (CSP) systems shall be prohibited.

#### B. Special Use Permit (SUP).

Solar Garden Energy Systems and Solar Farm Energy Systems shall require a Special Use Exception within the "A-1" Agricultural District, the "B-1" Business District, and the "I-1" Industrial Districts and shall be subject to the procedures and standards included in Section 150.2.2 Special Use Exceptions, in the Louisa County Zoning Ordinance unless otherwise stated in this Solar Energy Ordinance.

#### C. Special Requirements.

SGES and SFES are subject to the following requirements:

- 1) *Height.* Shall not exceed fifteen (15) feet at maximum tilt of the solar panel(s).
- 2) *Setbacks.*
  - a. The front yard setbacks shall be a minimum of fifty (50) feet from the edge of the right of way which form the outside perimeter of a SGES or SFES project area and one hundred (100) feet from a residence that is a part of the SGES or SFES project area. The Board of Adjustment may grant an exception to the setback requirement if the proposed or existing buffer is sufficient to screen the project from view of adjoining property or public rights-of-way, if the owners of the adjoining properties agree in writing to waive these setback requirements.
  - b. In the case of a SGES 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).

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- c. Solar panels shall be least three hundred (300) feet from a residence that is not part of the SGES or SFES project area. The Board of Adjustment may grant an exception to the setback requirement if the proposed or existing buffer is sufficient to screen the project from view of adjoining property or public rights-of-way, if the owners of the adjoining properties agree in writing to waive these setback requirements.
- d. Solar panels shall be eighty (80) feet from the State Right of Way and sixty (60) feet from County Right 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 by the Board of Adjustment as part of the review and approval process and will be based on adjacent or nearby surrounding land uses and topography.

- 4) *Fencing.* A security fence of at least six (6) feet in height but no greater than eight (8) feet shall enclose the SGES or SFES. To restrict access to public.

- 5) *Lighting.* If lighting is provided for the SGES or SFES, lighting shall be shielded and downcast such that the light does not project directly onto the adjacent parcels.

- 6) *Noise.* Noise levels caused by the SGES or SFES measured at the property line shall not exceed fifty (50) decibels when located adjacent to an existing residence or residential district.

- 7) *Installation and Design.* The SGES or SFES shall be designed and located in such a fashion so as to prevent glare toward any inhabited buildings on adjacent properties, as well as adjacent roadways.

- 8) *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.

- 9) *Outdoor storage.* Only the outdoor storage of materials, vehicles, and equipment that directly support the operation and maintenance of the solar farm or solar garden shall be allowed.

- 10) *Endangered Species and Wetlands.* Applicant shall seek natural resource consultation with the Iowa Department of Natural Resources.

- 11) *Weed control.* Applicant must present an acceptable weed/grass control plan for property inside and outside fenced area for the entire property. The operating company during the operation of the Solar Farm must maintain the fence and adhere to the weed control plan.

- 12) *Waste.* All solid wastes, whether generated from supplies, equipment parts, packaging, operation or maintenance of the SGES or SFES shall be removed from the site and disposed

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of in an appropriate manner. All hazardous waste generated by the operation shall be removed from the site immediately and disposed of in a manner consistent with all local, state, and federal requirements.

- 13) *Maintenance, repair or replacement of a facility.* Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to emergency response officials. Any retrofit, replacement or refurbishment of equipment shall adhere to all applicable local, state and federal requirements.

- 14) *Cleaning chemicals and solvents.* During operation of the proposed installation, all chemicals or solvents used to clean photovoltaic panels shall be low in volatile organic compounds and the operator shall use recyclable or biodegradable products to the extent possible. Any on-site storage of chemicals or solvents shall be referenced on the site plan.

- 15) *Road Use Agreements.* All routes on county roads that will be used for the construction and maintenance purposes shall be identified on the site plan. All routes for either ingress or egress shall be shown. The solar farm developer must complete and provide a preconstruction baseline survey to determine existing road conditions for assessing potential future damage due to development related traffic. The developer shall provide a road repair plan to ameliorate any and all damage, installation, or replacement of roads that might be required by the developer. The developer shall provide a letter of credit or surety bond in an amount and form approved by the appropriate highway authority(s) officials when warranted. The provision of this subsection shall be subject to the approval of the Louisa county Engineer.

- 16) *Soil erosion and sediment control.* The applicant agrees to conduct all roadwork and other site development work in compliance with a national pollutant discharge elimination system (NPDES) permit as required by the state department of natural resources and comply with requirements as detailed by local jurisdictional authorities during the plan submittal. If subject to NPDES requirements, the applicant must submit the permit for review and comment, and an erosion and sediment control plan before beginning construction. The plan must include both general "best management practices" for temporary erosion and sediment control (both during and after construction), and permanent drainage and erosion control measures to prevent both damage to local roads/adjacent areas and sediment laden run-off into waterways.

- 17) *Storm Water Management.* For the purposes of pollutant removal, stormwater rate and runoff management, flood reduction and associated impacts, the applicant shall provide a detailed storm water management plan with analysis of pre- and post-development stormwater runoff rates for review by local jurisdictional authorities.

- 18) *Administration and Enforcement.* The Zoning/Building Administrator and any necessary personnel may enter any property for which a special use or building permit has been issued

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under this ordinance to conduct an inspection to determine whether the conditions stated in the permit have been met as specified by statute, ordinance and code. Failure to provide access shall be deemed a violation of this ordinance.

#### D. Certification.

SGES 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 electric codes shall be followed.

#### E. Safety.

All SGES or SFESs shall provide the following at all locked entrances:

- 1) A visible "High Voltage" warning sign;
- 2) Name(s) and phone number(s) for the electric utility provider;
- 3) Name(s) and phone number(s) for the site operator;
- 4) The facility's 911 address, GPS coordinates; and,
- 5) A lock box with keys as needed.

#### F. Application.

The application for a Special Use permit for a Solar Garden Energy System or Solar Farm Energy System shall include:

- 1) A written summary of the project including a general description of the project and its approximate generating capacity.
- 2) The name(s), address(s), and phone number(s) of the owner and SGES or SFES operator.
- 3) The Interconnection Agreement.
- 4) A site plan of the SGES or SFES site showing:
  - a) Boundaries of the site;
  - b) All proposed SGES or SFES structures;
  - c) Property lines;
  - d) Setback measurements;
  - e) Location of all existing structures within the project area with their uses identified and any existing structure within three hundred (300) feet of the project area with their uses identified.
  - f) topography lines (2-foot contours); and

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(g) floodplain location, if applicable.

5) All other information contained in Section 19.7 of the Zoning Ordinance as may be required to file a petition.

To protect agricultural soils, all solar gardens and solar farms will be subject to a land evaluation site assessment (LESA). The LESA information will be utilized for a special use permit application and not for map amendment or rezoning purposes.

#### G. Decommissioning Plan.

Prior to applying for a building permit, the SGES or SFES project owner/operator shall submit a decommissioning plan to the Louisa County Zoning Administrator. The Zoning Administrator shall review the plan for completeness and refer it to the Louisa County Board of Adjustment. The plan shall include:

- 1) A description of the plan to remove the SGES or SFES equipment and restore the land to its previous use upon the end of the project's life, as stated in the Solar Energy Ordinance granting the Special Use Permit, or as stated in the Louisa County Zoning Ordinance.
- 2) Provisions for the removal of structures, debris, and associated equipment on the surface and to a level of not less than ten (10) feet below the surface, and the timeline/sequence in which removal is expected to occur;
- 3) Provisions for the restoration of the soil, vegetation and disturbed earth, which shall be graded and reseeded;
- 4) An estimate of the decommissioning costs certified by a licensed professional engineer in current dollars. The engineer providing this estimate shall submit it to the Louisa County Zoning Administrator for review and all costs associated with this engagement shall be borne by the applicant.
- 5) A written financial plan approved to ensure that funds will be available for decommissioning and land restoration;
- 6) A provision that the terms of the decommissioning plan shall be binding upon the owner or operator and any of their successors, assigns, or heirs.
- 7) Upon review of the decommissioning plan, the Louisa County Board of Adjustment shall set an amount to be held in a bond, escrow, or other acceptable form of funds approved by the Board. The value of the surety shall not be reduced based on the salvage value of any materials or equipment. The plan shall state that Louisa County shall have access to the project and to the funds to effect or complete decommissioning one (1) year after cessation of operations; and,
- 8) The applicant shall provide the county with a new estimate of the cost to decommission the SGES or SFES project every five (5) years under the same conditions as set forth in this Sections above. Salvage value of structures, electrical wire and other appurtenances

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shall not be considered with in the cost estimate calculations. Upon receipt of this new estimate, the county may require, and the applicant, owner, and/or operator of the SGES or SFES project shall provide, a new financial plan for decommissioning acceptable to the county. Failure to provide an acceptable financial plan shall be considered a cessation of operations.

9) **Release of Financial Security.** Financial security shall only be released when the Zoning Administrator determines, after inspection, that the conditions of the decommissioning plan have been met.

#### H. Building Permit

Before a building permit is issued, the following shall be submitted to the Louisa County Zoning Administrator for review:

1) Site plan with all items previously required in the petition. Additional items to be included are:

- a) All SGES or SFES structures including, but not limited to, the project solar panels, substation, interconnect substation, and location and voltage of any overhead transmission lines;
- b) Ancillary equipment;
- c) Transmission lines;
- d) Wells;
- e) Sanitary infrastructure (i.e. Septic fields);
- f) Field tile location;
- g) Existing easements; and,
- h) Wetland location, if any.

2) **Emergency Plan.** The site and emergency plan shall be submitted to the local fire protection district(s) and/or department(s) whose jurisdiction is included in whole or in part within the SGES or SFES project area. Any specialized training necessary will be provided at the operator's expense.

3) All required studies, reports, certifications, and approvals demonstrating compliance with the provisions of this ordinance.

After a review and acceptance of site plan and required information, a letter authorizing construction shall be issued.

#### 1.04 Indemnification and Liability.

The applicant, owner, and/or operator of the SGES or SFES project shall defend, indemnify, and hold harmless the County of Louisa and its officials from and against any and all claims, demands, losses,

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suites, causes of action, damages, injuries, costs, expenses, and liabilities whatsoever, including attorney's fees, without limitation, arising out of acts or omissions of the applicant, owner, and/or operator associated with the construction and/or operations of the SGES or SFES project.

#### 1.05 Cessation of Operations.

Any SGES or SFES provided for in this ordinance that has not been in operation and producing electricity for at least one hundred and eighty (180) consecutive days, excluding natural catastrophic event, shall be removed. The Louisa County Zoning Administrator shall notify the owner to remove the system. Within ninety (90) days, the owner shall either submit evidence showing that the system has been operating and producing electricity or remove it. If the owner fails to or refuses to remove the solar energy system, the violation shall be referred to the Louisa County Attorney. In the case of a natural catastrophic event, a detailed restoration plan to return to operational status must be provided to the Zoning Administrator.

#### 1.06 Violations & Penalties.

Violations and Penalties of this division are set forth in Division 140.

#### 1.07 Solar Farm Energy System owner/County/Property Owner Restoration Agreement.

A. Reasonable evidence of financial ability to construct the solar energy system as determined by the Board of Adjustment is a condition precedent to the issuance of any special use or building permit under this ordinance.

B. Louisa County and/or the property owner leasing land for a solar energy system shall require a performance bond, surety bond, escrow account, letter of credit or other financial assurance to Louisa County and/or property owner for each solar energy system that guarantees the performance of the restoration agreement, as referenced in the Decommissioning Plan.

#### 1.08 Related Rules and Regulations.

Each Solar Energy System shall comply with all applicable local, state and federal requirements.

#### 1.09 Severability.

The provisions of this ordinance are severable, and the invalidity of any section, subdivision, paragraph or other part of this ordinance shall not affect the validity or effectiveness of the remainder of the ordinance.

#### 1.10 Special Use Permit Fee Structure for Solar Garden Energy Systems and Solar Farm energy Systems.

For Systems Sized	Permit Fee
0-50 kilowatts (kW-dc)	\$300
51-100 kilowatts (kW-dc)	\$500
101-500 kilowatts (kW-dc)	\$1,000

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501 - 1000 kilowatts (kW-dc)	\$3,000
1000 - 2000 kilowatts (kW-dc)	\$6,000
> 2000 kilowatts (kW-dc)	\$200 for each additional 0-100 kilowatts, with a maximum of \$10,000.

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Source: [https://louisacountyia.gov/wp-content/uploads/2021/09/Proposed-Division-115\\_SolarEnergySystems\\_v2.pdf](https://louisacountyia.gov/wp-content/uploads/2021/09/Proposed-Division-115_SolarEnergySystems_v2.pdf)



## POLK COUNTY IOWA SOLAR REGULATIONS - EXCERPT

### Section 3. Solar Panels and Solar Arrays

- (A) Solar Panels – building mounted are permitted as an accessory structure in all districts. Permits required to determine structural compatibility.
- (B) Solar Arrays permitted as an accessory structure in all districts. Must meet accessory setback requirements. Permits required to determine structural compatibility.

Source: <https://www.polkcountyiowa.gov/media/1nwmgsy/zoning-ordinance-updated-2-1-2019-rev-5-06-19.pdf>

## MONONA COUNTY IOWA SOLAR REGULATIONS

CHAPTER 100	Zoning Regulations	CHAPTER 100	Zoning Regulations
<p><b>100.36 SOLAR ENERGY SYSTEMS.</b> The intent of the regulations of this Section is to balance the need for clean, renewable energy resources with the need to protect the public health, safety, and welfare. The regulations of this Section are found to be necessary to ensure that solar energy systems are appropriately designed, sited, and installed. Solar energy systems include accessory systems for private use, and solar farms for utility-scale energy production and distribution.</p> <p>1. <b>Use.</b></p> <p>A. <b>Accessory Use.</b> Accessory Solar Energy Systems shall be allowed only as an accessory use to a permitted principal use in residential, commercial, and industrial zoning districts and land uses. Accessory use shall also be allowed in agricultural zoning districts and land uses.</p> <p>B. <b>Principal Use.</b> Solar Farms designed for utility-scale energy production and distribution shall be allowed as a principal use only in agricultural zoning districts and land uses.</p> <p>2. <b>Special Use Permit Required.</b> No zoning permit shall be issued for any utility-scale solar energy system that is proposed to be constructed until after a Special Use Permit has been approved by the Zoning Board of Adjustment in accordance with Section 100.32 of this Chapter. This shall not apply to Accessory Solar Energy Systems.</p> <p>A. The special use permit shall be valid so long as the structure conforms to the site plan on file with the Monona County Zoning Administrator and the Monona County Zoning Ordinance.</p> <p>3. <b>Zoning Permit Required.</b> It shall be unlawful to construct, erect, install, alter, or locate any solar energy system within Monona County, unless a zoning permit has been obtained from the Zoning Administrator or their designee. In granting such permit, the Zoning Administrator or their designee may impose conditions on the use in addition to the regulations of this Section. The zoning permit may be revoked by the Zoning Administrator or their designee any time the approved system does not comply with the regulations of this Section and the conditions imposed at the time the permit was granted. The owner and/or operator of the solar energy system must also obtain any other permits required by other federal, state, and local agencies or departments prior to obtaining an approved zoning permit or installing the system, and shall comply with all overlay district regulations.</p> <p>4. <b>Permit Application Information.</b> An application for a zoning permit for a solar energy system shall be made on forms provided by the County. Along with the application, the applicant shall submit the following information:</p> <p>A. <b>Site Plan.</b> One (1) complete copy of a site plan and fee shall be submitted in accordance with Section 100.25. The site plan shall be based on a certified instrument survey by a surveyor licensed in the State of Iowa. A Plat of Survey is required to establish property lines and/or setbacks. The site plan shall include the following:</p>	<p>(1) Location of the solar panel(s) on the site and total height of the each panel or array at maximum tilt, dimensions, and ground clearance for each panel or array;</p> <p>(2) The height and depths of each mounting structure including footings, and maximum area of ground cover;</p> <p>(3) Utility lines, telephone lines and any other lines, both above and below ground, within 200 feet of any and all above-ground portions of the solar energy system or solar farm;</p> <p>(4) Details as to how the power will be delivered to the grid, including the route and size of poles and towers to be used, if applicable;</p> <p>(5) Property lot lines, land uses and the location and dimensions of all existing structures and uses on and off site within a radius of 500 feet of any and all above-ground portions of the solar energy system or solar farm;</p> <p>(6) Standard drawings and dimensional representations of the solar energy system including panels and arrays, mounting structures, and footings;</p> <p>(7) Planned location and dimensions of a security fence; and</p> <p>(8) Interconnection agreement with the electrical utility, if applicable.</p> <p>B. <b>Decommissioning Plan.</b> All applications for solar farms shall include a decommissioning plan that describes the anticipated life of the utility scale 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.</p> <p>C. <b>Landscaping.</b> A landscape buffer may be required to be installed and maintained during the life of the solar farm. Determination of screening requirements will be made by the Board of Adjustment as part of the review and approval process and will be based on adjacent or nearby surrounding land uses and topography.</p> <p>D. <b>Grading Plan.</b> A grading plan shall be submitted for all solar energy system plans and shall show all proposed changes to the landscape of the site, included but not limited to: clearing, grading, topographic changes, drainage, and tree removal.</p> <p>6. <b>Accessory Solar Energy Systems.</b> Accessory solar energy systems shall be for the sole benefit of the parcel or lot on which it is located.</p> <p>B. Building- or roof-mounted systems shall not exceed the bulk regulations of the district or land use on which the building sits.</p> <p>(1) Such systems shall not extend beyond the perimeter of the building, except</p>	<p>September 20, 2018</p> <p>CODE OF ORDINANCES MONONA COUNTY, IOWA</p>	<p>September 20, 2018</p> <p>CODE OF ORDINANCES MONONA COUNTY, IOWA</p>
<p>that exterior piping for hot water systems may exceed the exterior perimeter in a side yard.</p> <p>(2) Roof-mounted systems may be visible from the public right-of-way.</p> <p>(3) Roof-mounted systems shall require adequate roof access to the panels.</p> <p>(4) Prior to installation, the applicant must provide documentation of the building's structural capacity to the Zoning Administrator or their designee.</p> <p>C. Solar hot water systems must have an SRCC (Solar Rating &amp; Certification Corporation) rating.</p> <p>D. Accessory systems must comply with the State of Iowa Building Code, Electric Code, and Plumbing Code.</p> <p>E. All accessory systems must comply the regulations of all overlay zones in which it is located.</p> <p>F. All accessory systems must comply with the requirements of the electric utility. Self-contained (off-grid) systems that are not connected to the electric utility are exempt from the interconnection requirements.</p> <p>G. Surplus energy sold back to a utility must comply with Section 199, Chapter 15.11(5) of the Iowa Administrative Code, and all requirements of the Iowa Utilities Board.</p> <p>7. <b>General Regulations.</b></p> <p>A. Ground- or pole-mounted panels and arrays shall not exceed 20 feet in height at maximum tilt.</p> <p>B. All solar energy systems must have a UL (Underwriters Laboratories) listing.</p> <p>C. <b>Airports.</b> All solar energy systems located within 500 feet of an airport or within approach zones of an airport requires the applicant to complete and provide the results of the Solar Glare Hazard Analysis Tool (SGHAT) for the Airport Traffic Control Tower cab and final approach paths, consistent with the <i>Interim Policy, FAA Review of Solar Energy Projects on Federally-Obligated Airports</i>, or most recent version adopted by the FAA. The applicant shall also obtain written approval from all appropriate airport authorities, including but not limited to James G. Whiting Memorial Field in Mapleton.</p> <p>D. <b>Solar Access.</b> Solar Access rights may be purchased from neighboring property owners through the recording of a solar easement. This easement may apply to buildings, trees, or other plants and structures that would diminish solar access.</p> <p>8. <b>Abandonment.</b> Abandonment proceedings begin one (1) year after the last day any solar energy system produces power.</p>	<p>A. The owner shall have one (1) year after abandonment proceedings have commenced to begin generating electricity with the unit or to decommission and safely dispose of the solar unit.</p> <p>B. Upon final declaration of abandonment, Monona County shall cause the removal of the abandoned system and invoice the property owner for all costs associated with the removal of the solar energy system and reclamation of the site. If unpaid, the cost shall be assessed as a lien against the property.</p>	<p>September 20, 2018</p> <p>CODE OF ORDINANCES MONONA COUNTY, IOWA</p>	<p>September 20, 2018</p> <p>CODE OF ORDINANCES MONONA COUNTY, IOWA</p>

Source: <https://mononacounty.iowa.gov/Zoning/AmendedMCChapter100.pdf>

**LEGAL PUBLICATION**

As of the writing of this report, the public hearings for consideration of this proposal are to be published in the following papers: Sergeant Bluff Advocate – July 27, 2023; Danbury Review – July 26, 2023; Merville Record – July 27, 2023; Sioux City Journal – July 27, 2023.

**STAKEHOLDER COMMENTS**

911 COMMUNICATIONS CENTER:	No comments.
CENTER FOR RURAL AFFAIRS	SEE EMAIL WITH ATTACHMENTS BELOW FROM ALEX DELWORTH, 5/19/23
CITIES OF ANTHON, BRONSON, CORRECTIONVILLE, CUSHING, DANBURY, HORNICK, LAWTON, MOVILLE, OTO, PIERSON, SALIX, SERGEANT BLUFF, SIOUX CITY, SLOAN, AND SMITHLAND	No comments.
FIBERCOMM:	No comments.
IOWA DEPARTMENT OF NATURAL RESOURCES (IDNR):	No comments.
IOWA DEPARTMENT OF TRANSPORTATION (IDOT):	No comments.
LOESS HILLS NATIONAL SCENIC BYWAY:	No comments.
LOESS HILLS PROGRAM:	No comments.
LOGLINES:	No comments.
LUMEN:	No comments.
MAGELLAN PIPELINE:	No comments.
MIDAMERICAN ENERGY COMPANY (Electrical Division):	I have reviewed the attached proposed ordinance amendment proposal for MEC electric, and we have no conflicts. If you have any questions or concerns, please let me know. – Casey Meinen, 7/18/23.
MIDAMERICAN ENERGY COMPANY	MidAmerican has no comments to the proposed solar zoning ordinance. Though MidAmerican has no plans to expand our solar footprint in Woodbury County at this time, we believe it is important to allow landowners and utilities to partner to ensure the reliability and affordability of electric power in the county. Allowing utility solar as a conditional use of AP zoned land is a step in that direction. If you or the board have any questions please feel free to reach out. Thanks. – Will Dougherty, P.E., 5/22/23.
NATURAL RESOURCES CONSERVATION SERVICES (NRCS):	No comments.
NORTHERN NATURAL GAS:	No comments.
NORTHWEST IOWA POWER COOPERATIVE (NIPCO):	Have reviewed this zoning request. NIPCO has no issues with this request. – Jeff Zettel, 7/18/23.
NUSTAR PIPELINE:	No comments.
SIOUXLAND DISTRICT HEALTH DEPARTMENT:	No comments.
WIATEL:	No comments.
WOODBURY COUNTY ASSESSOR:	No comments.
WOODBURY COUNTY CONSERVATION:	I don't see any conflicts or issues unless I am missing something. I expect you would point it out to me if so. 😊 No complaints here! Thanks Dan – Daniel Heissel, 7/20/23.
WOODBURY COUNTY EMERGENCY MANAGEMENT:	No comments.
WOODBURY COUNTY EMERGENCY SERVICES:	No comments.
WOODBURY COUNTY ENGINEER:	I concur with the proposed changes to the ordinance presented in your review request. I think these are good changes and not overly burdensome for landowners who want to supplement their power with their own solar panels. Thanks for the review request. – Mark Nahra, P.E., 7/18/23.
WOODBURY COUNTY RECORDER:	I have no comments. Thank you. – Diane Swoboda Peterson, 7/17/23.
WOODBURY COUNTY RURAL ELECTRIC COOPERATIVE (REC):	No comments.
WOODBURY COUNTY SOIL AND WATER CONSERVATION DISTRICT:	No comments.

## Daniel Priestley

---

**From:** Alex Delworth <alexdelworth@cfra.org>  
**Sent:** Friday, May 19, 2023 1:02 PM  
**To:** Daniel Priestley  
**Subject:** Zoning meeting - solar ordinance  
**Attachments:** Iowa Solar Siting Resource Guide - A Roadmap for Counties.pdf; Decommissioning Solar Energy Systems Resource Guide.pdf; Policy Approaches for Dual-use and AgriSolar Practices.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

**CAUTION:** This email originated from **OUTSIDE** of the organization. Please verify the sender and use caution if the message contains any attachments, links, or requests for information as this person may NOT be who they claim. If you are asked for your username and password, please call WCICC and **DO NOT ENTER** any data.

Hey Dan,

Thank you for taking my call and talking with me earlier today. As a refresher, I am a policy associate with the Center for Rural Affairs. The center is a private non-profit organization that advocates for policies that strengthen rural communities and connect rural citizens with opportunities to engage in decisions that affect their lives.

As we discussed, I wanted to share our clean energy siting library which has several neutral fact-based reports and guides on clean energy issues to inform rural decisionmakers during ordinance development. Attached to this email is our Iowa solar siting guide, a policy report on dual-use and agri-solar practices, and a decommissioning solar energy guide. I think these would be the most applicable resources from our conversation, however you can check out our [full library here](#) for more topics.

Please don't hesitate to reach out if you have any questions and I encourage you to share this with the full zoning commission.

Thank you,

—

Alex Delworth | Policy Associate  
Center for Rural Affairs  
1400 Fawcett Pkwy, Suite D2 | Nevada IA 50201  
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# IOWA SOLAR SITING RESOURCE GUIDE: A ROADMAP FOR COUNTIES



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## IOWA SOLAR SITING RESOURCE GUIDE: A ROADMAP FOR COUNTIES

### INTRODUCTION

**Solar at all scales is a growing opportunity in the state of Iowa.** From immense growth in the customer-owned solar market to the emergence of utility-scale and community solar projects, Iowa appears to be at the beginning of a solar boom. For counties presented with the opportunity of large-scale solar projects, an important tool to consider is a well-drafted ordinance. A good ordinance will preserve the interests of the county and its residents while enabling developers to build workable, cost-effective projects. Under Iowa's home rule policy, counties have latitude to adopt ordinance provisions related to solar development.

A well-crafted ordinance will take into consideration the jurisdiction of the Iowa Utilities Board (IUB) to approve projects that are 25 megawatts or larger in size.

**Solar in Iowa has grown from around two megawatts (MW) in 2012 to about 115 MW today.<sup>1</sup>** The first utility-scale projects came before the Iowa Utilities Board for approval in the summer of 2019 with a 100 MW project proposed in Louisa County and a series of projects totaling 749 MW proposed for Worth, Mitchell, and Howard Counties. Multiple projects are in the works and counties around Iowa are preparing for this exciting future.

This guide focuses on siting practices for two types of large solar energy developments: Utility-Scale Solar and Community Solar. We will not focus on personal solar energy systems, such as those used at homes, farms, and businesses to produce electricity for usage on-site.

While large-scale solar development may be in its early days in Iowa, a handful of Iowa counties have already adopted solar ordinances and many of our neighbors in the Midwest have already seen utility-scale development. In addition to existing Iowa ordinances, **we have reviewed the ordinances and best practices from neighboring states and identified specific provisions that local officials can use as a road map for their own ordinances.**

As solar energy gains momentum across Iowa, community solar projects are becoming more common. Cities including Ames, Bloomfield, and Cedar Falls have adopted or are in the process of constructing community solar projects. For many Iowans, community solar projects offer an opportunity to invest in renewable energy without having to construct a system on their own. This type of project allows renters, homeowners and businesses with shaded roofs, and other community members to enjoy the benefits of solar energy while offering an opportunity for utilities to provide a clean source of energy to residents and businesses. This guide includes an addendum of resources for those considering community solar projects.

**We encourage counties that are considering an ordinance, or updating an ordinance, to use this document as a reference to support the development and adoption of a well-designed ordinance rooted in existing successful practices.**

*This document is not legal advice and users of this guide should consult an attorney with specific legal questions.*



**We encourage counties that are considering an ordinance, or updating an ordinance, to use this document as a reference to support the development and adoption of a well-designed ordinance rooted in existing successful practices.**



## IOWA SOLAR SITING RESOURCE GUIDE: A ROADMAP FOR COUNTIES

### STATE AND LOCAL BENEFITS FROM SOLAR DEVELOPMENT AND FUTURE POTENTIAL

Iowa has what it takes to be a national leader in solar energy. The state ranks 16th among U.S. states in technical potential for solar energy production, putting Iowa ahead of states such as Florida, Georgia, and South Carolina. A solar photovoltaic (PV) array located in Iowa produces a comparable amount of electricity as one located in Miami or Atlanta, and more than arrays located in Chicago.<sup>2</sup>

Iowa is poised for significant solar development. The rapidly improving economics of solar energy are now driving large-scale projects. A recent report found that the levelized cost of energy for utility-scale solar declined 89 percent between 2009 and 2019.<sup>3</sup> Using ground-mount solar systems to meet five (5) or 10 percent of Iowa's annual electricity needs would require a very small geographic footprint. Using just 21 of Iowa's 55,857 square miles of land for solar PV would provide 10 percent of Iowa's electricity needs.<sup>4</sup> There were 3,294 MW of potential solar projects in Iowa being studied for connection to the grid by the regional grid operator Midcontinent Independent System Operator (MISO) at the end of 2019.<sup>5</sup>

Counties may play a role in solar development by reviewing and approving specific solar projects. County policies that guide review and approval need to strike a balance between concerns expressed by county residents and successful, cost-effective solar development. An ordinance can be a critical part of achieving a balance and seeing maximum local benefits from solar generation.

**Solar development offers a number of benefits to county residents and the county itself. These benefits include:**

- **Lease or easement payments to landowners.** Payments to landowners provide long-term, stable streams of revenue.
- **Property tax revenue to counties.** Solar arrays generate property tax revenue paid to counties that can support a range of public benefits, including roads and bridges, health services, schools, debt service, and reduced need for revenue from other sources.
- **Replacement tax revenue to counties.** State law provides a defined replacement tax for electric generating facilities to ensure similar tax treatment for potential competitors within the state. The replacement tax revenue to counties may be almost as large as the property tax revenue.
- **Clean energy resources.** Unlike fossil-fuel power plants, solar arrays do not produce air pollutants such as sulfur dioxide, nitrogen oxide, greenhouse gases, particulates, or mercury, thus reducing acid rain, smog, and public health impacts such as pulmonary and heart disease and asthma. Solar arrays also do not use water or produce water pollution in the process of generating electricity or produce hazardous waste that threatens public health, unlike fossil and nuclear power plants.
- **Local economic development.** In 2018, Iowa had nearly 850 jobs supported by the solar



Industry.<sup>6</sup> The U.S. Bureau of Labor Statistics found in 2019 that solar installers are projected to be the fastest growing job in the United States through 2026, with the position expected to grow by nearly 105 percent during that time span.<sup>7</sup> There are nearly 100 Iowa businesses involved in the solar energy supply chain.<sup>8</sup> These jobs are located across the state in a range of sectors including manufacturing, installation, and operations and maintenance.

## DEFINITION OF TERMS

Like many areas of technology and regulation, solar siting terminology uses jargon that is critical for local government officials to understand and define in order to create a clear ordinance. The list of terms provided here is not exhaustive, but defines many of the terms counties should consider adding to the definitions section of a solar siting ordinance.

- **Utility-Scale Solar Energy System:** A solar energy system above a certain capacity that is intended to produce electricity to sell into the market, not to directly supply end-use customers. These systems are larger than small-scale residential or business solar installations and many community systems, often covering more land area.  
*Note: If a system is 25 MW or larger, it will need to obtain a siting certificate from the Iowa Utilities Board (IUB). The hearing for the siting certificate will be held in the county where construction is to occur and the county will be a party to the proceeding. Solar energy systems smaller than 25 MW do not require a siting certificate.*
- **Community Solar:** A solar energy system developed by a municipality, utility, or other third party that typically allows community members to subscribe to the project. In Iowa, development of community solar projects is limited to utilities at this time.
- **Easement:** A legal agreement for the use of property for a specified purpose.
- **Feeder circuits/lines:** A power line or network of lines used as a collection system that carries energy produced by a solar energy system to an interconnection point like a substation. Feeder circuits are most often placed underground.
- **Glare/glint:** Light reflected off of a surface.
- **Interconnection:** Link between a generator of electricity and the electric grid. Interconnection typically requires connection via infrastructure such as power lines and a substation, as well as a legal agreement for the project to be connected to the grid.
- **Module:** An individual unit comprised of multiple photovoltaic (PV) cells, with multiple modules used in a solar energy system.
- **Mounting:** The method of anchoring solar energy system modules to the ground or a building.
- **Non-participating landowner:** Any landowner that has not signed a lease agreement for an easement with the project owner or developer, often adjacent to or near the project.

- **Operator:** The entity or individual that operates a solar energy system.
- **Owner:** The entity or individual that has ownership over a solar energy system.
- **Participating landowner:** A landowner who has signed a lease agreement for an easement with a project owner.
- **Residential/small-scale solar energy system:** A solar energy system that is installed at a residence or business to meet the electric demand at the location. These systems are typically intended to offset electricity use for the owner and are not intended to be net generators of electricity.
- **Solar energy system:** A system that converts energy from sunlight into electricity or an additional energy source such as heat.
- **Substation:** A facility that converts electricity produced by a generator like a solar energy system to a higher voltage, allowing for interconnection to high-voltage transmission lines.
- **System height:** The height of a solar energy system, usually referring to ground mounted systems. Total system height is the measurement from the ground to the top of the mounting or modules associated with a system. Counties may also wish to include an additional height definition for ground clearance, or the measurement between the ground and the bottom of modules or mounting.
- **Transmission lines:** Power lines used to carry electricity from collection systems or substations over long distances.

## BEST PRACTICES OF SOLAR SITING



## SUMMARY OF BEST PRACTICE RECOMMENDATIONS

Our recommendations for solar ordinance provisions to enable responsible solar development and the benefits that come with it include:

- **Application and approval process.** We recommend that counties establish a clear and well-defined application process with a set of known application requirements. Solar projects should be treated either as a permitted use or as a conditional use in established zoning districts. If the application and associated solar development meet the clearly identified conditions, the application and project should be approved.
- **Siting**
  - **Zoning districts.** Counties should allow for the siting of utility-scale and community solar in a variety of districts.
  - **Site plan and requirements.** Part of the application and approval process may include a plan describing the project in detail as well as a number of site and structure requirements. For projects 25 MW or larger, we recommend that the county accept the Application for a Certificate, required by the Iowa Utilities Board, in lieu of a separate county application.
- **Setbacks.** Counties should ensure that setbacks balance multiple interests and support cost-effective solar development. Counties should also provide for waivers for voluntary reduction in setbacks.
- **Operations & maintenance plans and land use.** To address both short-term and long-term maintenance of a project area, counties may require an operations and maintenance plan and adopt land use requirements.
- **Infrastructure.** Counties may require a pre-construction plan for handling potential impacts to roads and other infrastructure from solar project construction as well as a post-construction review to identify impacts and provide for repairs.
- **Decommissioning.** Counties may require a decommissioning plan as part of the application and approval process to ensure restoration of land once a project is no longer operating.

## MAJOR PROVISIONS FOR COUNTY SOLAR ORDINANCES

Successful solar siting ordinances will balance the interests of the county, project participants, and non-participants while allowing for cost-effective development. Ordinances can preserve these interests without imposing onerous restrictions. In order to allow for successful solar development, ordinances should rely on established best practices.



## APPLICATION AND APPROVAL PROCESS

Iowa Code constrains to some extent the procedural options available to counties for consideration and approval of large-scale solar. The best practices recommended in this section apply primarily to counties that have adopted zoning and may not apply to counties without zoning.

### RECOMMENDATIONS:

- We recommend that counties adopting a solar ordinance first adopt an amendment to their comprehensive plan with a statement about their intentions for solar development in the county, the benefits of investments in solar, and the key considerations around regulating solar siting.
- We recommend that county officials prioritize creating a clear application and review process with well-defined steps and conditions for approval. This allows a solar developer to clearly identify the application requirements for a solar project which, if met, will result in county approval of the application. The setback provisions described below would be one of the clear application requirements, while the additional provisions discussed in this document can comprise the balance of those requirements (e.g. decommissioning, site plan, road use plan, etc.)
- Any application fees must not exceed the cost of processing the application, including any required inspection.<sup>9</sup>

## PROCESS



### COMPREHENSIVE PLAN UPDATE

Iowa code specifies that zoning ordinances and decisions "shall be made in accordance with a comprehensive plan..."<sup>10</sup> (Iowa Code § 335.5). For this reason, we recommend a county looking to attract solar and other renewable energy development first adopt an amendment to align a county comprehensive plan with a county's intentions to attract such development.



**EXAMPLE: CEDAR COUNTY**

"Goal III. Encourage the creation and use of alternative and renewable energy sources.  
Objective 1: Increase alternative and renewable energy sources in the county.

**Strategies:** Review and modify the zoning ordinance and other relevant county regulations as necessary to remove barriers to the use of renewable energy systems such as solar, wind, and geothermal."

The County should promote the use of renewable and inexhaustible energy sources over non-renewable energy sources. . . ."<sup>11</sup>

**OPTIONS FOR SITING**

Counties can use various processes to govern solar siting. The two most straightforward options are to make solar systems a permitted use (also sometimes called an "allowed" or "principal" use) in specific zones or designating solar systems as a conditional use (also called a "special use" or "special exception"). In the case of a conditional use, supervisors should define the conditions that the project must meet to be approved.

*Solar as a Permitted Use*

If a county ordinance designates solar as a permitted use, county staff reviews projects to determine compliance with objective ordinance requirements. County staff would be able to determine objective requirements, such as whether a project meets required setbacks, but would not be able to decide on subjective requirements such as whether a particular project "fits the area." If the project complies with the ordinance, it can move forward. County staff typically issue a building or zoning permit under this approach.

*Solar as a Conditional Use*

The term "conditional use" in a zoning code usually means that a use may be allowed or permitted in a specified district (or districts) on the condition that certain requirements are met. Conditional use permitting decisions depend on the applicant's compliance with the standards specified in the zoning code as conditions for permit approval. These conditions may be more subjective but the decision criteria must be included in the ordinance. Conditional uses can only be permitted subject to review and approval of a county zoning board of adjustment (ZBA) after a public hearing. The ZBA should base its decision on evidence presented in the public hearing and evaluate the project based on the project's compliance with the conditions in the ordinance. If the conditions are met, the permit should be issued.

Uses permitted on this basis are generally those that a county considers not generally adverse to the public interest, but requiring some special review and precautions as well as an opportunity for public input.

Counties may wish to require the filing of items such as site plans, road use agreements, and decommissioning plans as conditions for approval. These are described in more detail below.

If a county opts for conditional use permitting through the ZBA, we recommend providing applicants with the opportunity for a preliminary review and pre-application process. Iowa law provides that appeals of a final decision of the ZBA go to court for review.<sup>12</sup> Allowing for preliminary review and a pre-application process helps provide applicants with a more predictable process and can minimize the potential for time-consuming or expensive judicial review.

For projects that are 25 MW or larger, the county has the opportunity to state whether the solar energy system meets the county zoning requirements, as a designated party to the Iowa Utilities Board's public hearing held in the county as a part of the single hearing siting process required under section 476A.11 of the Iowa Code.<sup>13</sup>

**DESIGNATING ZONING DISTRICTS FOR SOLAR**

Counties may allow siting of utility-scale solar in a variety of districts. An easy place to start for solar development in zoning districts would generally be designating business, commercial, industrial, and agricultural districts as eligible for utility-scale projects. After seeing development in one or more of these districts, additional districts could be considered.

Smaller-scale or community solar may be appropriate in more types of zoning districts, including those within or close to residential neighborhoods. This is especially appropriate if participants in the community solar project live in those districts.

**EXAMPLES OF DISTRICTS WHERE IOWA COUNTIES WITH ZONING ALLOW SOLAR DEVELOPMENT:**

**Linn County:** Agricultural District, Highway Commercial District, General Commercial District, Industrial District, Critical Natural Resources District

**Clinton County:** Prime Agricultural District, Agricultural - Recreation District, Highway Commercial District, Rural Support Commercial District, Limited Industrial District, General Industrial District

**Louise County:** Agricultural District, Business District, Industrial District

**APPLICATION REQUIREMENTS****RECOMMENDATIONS:**

- **Project applications should provide essential information to county boards and zoning officials. While some information may be required at the time of application, officials may wish to allow applicants to submit additional information at a later date.**

- **For projects 25 MW or larger, we recommend that the county accept the Application for a Certificate, required by the Iowa Utilities Board, in lieu of a separate county application.**

**GENERAL REQUIREMENTS**

County ordinances may include a number of site and structure requirements, many of which are discussed in further detail within this document. Some counties may ask for this information as part of a "site plan." Items required in an application for a utility-scale solar energy system may include:

- 1) Name of applicant.
- 2) Name of the project owner.
- 3) Description of the project — number of modules, manufacturer, mounting type, system height, system capacity, total land area covered by the system, and information about associated facilities like substations, feeder lines, battery storage, etc.
- 4) Legal description of the property where the solar energy system will be located.
- 5) Map of the project location and the surrounding area.
- 6) A decommissioning plan outlining the process for system removal—including individual modules and mounting—and property restoration before an easement is returned to a landowner.
- 7) Evidence of a power purchase agreement or interconnection application for the project.
- 8) Consultation with or notifications from relevant state and federal agencies showing the project will not be a hazard to wildlife, communications, air traffic, etc.
- 9) Documentation of easement locations acquired for solar energy systems and associated facilities.

Because the IUB requires similar types of information as part of the Generating Certificate application process, we recommend that for projects above 25 MW, counties accept the information submitted in such an application to the IUB in lieu of a separate application to avoid duplication.

**SETBACKS****RECOMMENDATIONS:**

- **Property line setbacks should not exceed 50 feet; setbacks from occupied residences should stay within a range of 100 to 200 feet.**
- **Counties should include waiver provisions allowing for the county to waive the mandated setback distance with the consent of the participating landowner and adjacent property owner.**
- **No setbacks should be required if a property line is shared by two participating landowners.**

Counties may choose to put into place setbacks, which specify the required distance of the project from homes, roads or existing rights-of-way, property lines, and other locations. Unlike setbacks for wind turbines, which are intended to address rare but dangerous scenarios such as turbine collapse, there are no safety concerns that point to the necessity of a specific setback requirement for solar facilities. Before putting setbacks into place, counties should consider the issues that a setback is meant to address and whether there is a separate project requirement that may better address it. While some level of setback may be appropriate, officials should carefully consider setback distances and the limits they may place on future development.

Many counties require solar installations to follow the same setback requirements (from property lines and rights of way) as other structures in the zoning district where they are located. Some counties opt for prescribed setback distances from property lines and occupied structures.

**SETBACKS FROM RESIDENCES AND PROPERTY LINES**

Some counties require specific setback distances between the solar system and property lines of occupied residences.

According to our research, a 50 foot property line setback is included in a number of ordinances from Iowa's neighboring states. A 100 to 200 foot setback for residential dwellings is also common, with some ordinances at 100 feet, some at 150 feet and some at 200 feet. These distances seem workable for developers, participants, and nonparticipants.

Utility-scale solar energy systems are likely to be sited in zones where residential dwellings are uncommon but may occur (agriculture, industrial, commercial). Counties can adopt an occupied structure setback that both reflects the needs and local characteristics of these zones and stays within the 100 to 200 foot range. There is no justification for larger setbacks from a safety perspective and larger setback distances would unnecessarily limit solar development in a county.

We recommend that property line setbacks do not exceed 50 feet from a property line and stay within a range of 100 to 200 feet from an occupied residence.

**SETBACKS BASED ON ZONING DISTRICT**

Although we recommend counties adopt specific setback distances for solar systems, counties could also choose to follow the minimum setback requirements of the zoning district where they are located, similar to Linn and Clinton Counties.

Since structures or vegetation on neighboring properties may cast shadows onto a solar system, causing a decline in solar panel efficiency, Linn County recommends greater setbacks in lieu of a "solar access agreement." These agreements are discussed in further detail later in this document.

Community solar projects may be appropriate in more types of zoning districts, including those in or closer to residential neighborhoods, especially if participants in community solar live in those districts. For this reason, counties should consider using the setback requirements of the zoning area

where the project is located to govern the solar facility. Further considerations for community solar projects are discussed later in this guide.

#### SHARED PROPERTY LINES

When a solar array is built across the property line of two participating landowners, no property line setback is required in Louisa County.<sup>14</sup>

[Solar Farm Energy Systems] 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).

In the case that a property line is shared by two participating landowners, a setback serves no purpose so we recommend this as a best practice.

#### RIGHTS OF WAY

A county may require a specific setback distance from a roadway. In counties with zoning, we recommend using the right of way setback standards for principal or accessory use structures specific to the zoning district where the project is located. In counties without zoning, we recommend consultation with right-of-way operators to ensure that projects do not disrupt current or planned use.

#### WAIVERS OR NEGOTIATED SETBACKS

Waivers are an important tool to improve flexibility and allow for the potential for additional land area to become available for solar development. However, providing a waiver is not a substitute for a setback policy that can enable cost-effective solar development.

Louisa County allows for written waiver agreements to be executed pursuant to the specific requirements set forth in the ordinance along with approval by the Zoning Board of Adjustment.

We recommend that counties allow for a waiver of the mandated setback distance with the consent of the participating landowner and adjacent property owner.

#### ADDITIONAL SITING STANDARDS

##### RECOMMENDATIONS:

- Counties should carefully consider whether site and structure provisions are unnecessarily restrictive.
- Counties should allow for and encourage the project operator or owner to invest in fencing that facilitates movement of wildlife and pollinators.
- Solar access agreements should be facilitated by counties using Iowa Code § 564A.1 to guide their process.

- Counties should require appropriate safety warnings and signage at solar facilities.

County officials should carefully consider whether site and structure provisions are unnecessarily restrictive. Well-established solar zoning guides describe the importance of avoiding inadvertent obstacles in an ordinance's major provisions:

From the American Planning Association (APA): "Even in cases where zoning codes explicitly address solar energy systems, subtle barriers such as height restrictions, lot coverage limitations, and setback, screening, landscaping, and utility requirements may still impede solar development."<sup>15</sup>

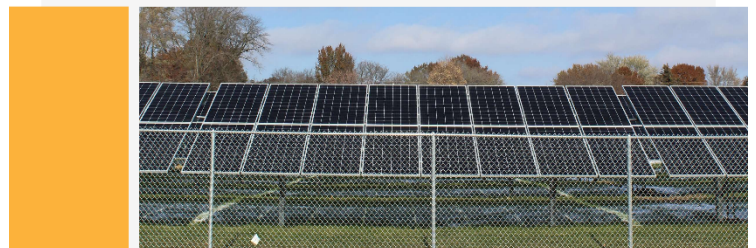
From the Great Plains Institute (GPI): "Limit regulatory barriers to developing solar resources. Ensure that access to solar resources is not unduly limited by height, setback, or coverage standards, recognizing the distinct design and function of solar technologies and land uses."<sup>16</sup>

#### FENCING

To protect the solar array and to provide for safety by preventing entry into a project area, counties may require fencing around the solar array. Both Clinton and Linn Counties use the same language to address fencing requirements:

A security fence must be installed along all exterior sides of the utility scale solar installation and be equipped with a minimum of one gate and locking mechanism on the primary access side. 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.<sup>17</sup>

Project developers are required to follow the specific fencing requirements of the National Electrical Code (NEC), which is updated every three years. Currently, the NEC requires a seven foot tall fence;



therefore we do not recommend that counties set their own fence height requirements.

Specific types of fencing may be desirable for reducing impacts to wildlife or limiting aesthetic concerns related to a project. For example, deer fencing may be less visually obtrusive while also allowing for wildlife and pollinators to move through a project area. This practice could soon be deployed in Iowa, as the developers of a large solar project in Howard County have proposed to surround the project area with deer fencing.<sup>18</sup>

County requirements for fencing should be limited because the NEC covers this requirement. However, we do recommend that counties allow for or encourage the project operator or owner to invest in fencing that facilitates movement of wildlife and pollinators.

#### HEIGHT RESTRICTIONS

The height of solar arrays is typically measured by the maximum tilt of the panels.

In some counties where large-scale solar is a permitted use, the height restrictions of solar arrays match the zoning district where they are located. Counties may also choose to set specific height limitations for solar systems. Counties could consider allowing for less stringent height restrictions if coupled with longer setbacks from neighboring properties. An example is adding two feet to the setback distance for each additional foot of height.<sup>19</sup>

It is important that counties do not set overly restrictive height limitations given ongoing research into potential agricultural co-uses of solar project areas such as livestock grazing and planting underneath panels. There are also no compelling safety reasons for height restrictions.

#### SOLAR ACCESS SPACE AND AGREEMENTS

Since solar panel performance relies on the amount of sunlight collected, counties may consider how improvements or new vegetative plantings on neighboring properties could cast shadows onto solar arrays. Developers may want an assurance of continued future access to sunlight to ensure project success over the 25 to 40 year life expectancy.

There are several Iowa statutory provisions that address access to solar energy and are intended to "facilitate the orderly development and use of solar energy."<sup>20</sup> Iowa Code encourages voluntary solar access easements and sets out requirements for easements to protect solar access. The Code also authorizes city councils and county boards of supervisors to establish solar access regulatory boards (or authorize certain existing boards for this purpose).

These regulatory boards have the power to grant solar access easements to properties hosting solar projects in order to protect access to solar energy. The code allows public bodies to include provisions that would compensate the owner of the solar project if shade interferes with the project and/or that would compensate the owner of the easement for maintaining the easement space.<sup>21</sup>

Linn County's ordinance provides for a "solar access agreement" process which is defined as a

"recorded easement which provides continued access to incident sunlight necessary to operate a solar collector."<sup>22</sup>

We recommend counties allow for solar access agreements using Iowa Code § 564A.1 to guide their process.

#### SAFETY AND SIGNAGE

Projects may be required to post signs that clearly feature the name, address, emergency contact information for the operator, and warnings. Safety requirements typically include clear safety notices to the public, such as high voltage warnings. Louisa County requires the following guidance on signage in its ordinance:

[Solar Farm Energy Systems] shall provide the following at all locked entrances:

- 1) A visible "High Voltage" warning sign;
- 2) Name(s) and phone number(s) for the electric utility provider;
- 3) Name(s) and phone number(s) for the site operator;
- 4) The facility's 911 address, GPS coordinates; and,
- 5) A lock box with keys as needed.<sup>23</sup>

These requirements are an appropriate best practice.



#### OPERATIONS AND MAINTENANCE PLANNING

##### RECOMMENDATIONS:

- Counties should adopt an operations and maintenance plan designed to avoid negative impacts on the surrounding land, water, and neighbors.
- We encourage counties to consider requiring native vegetation to bolster wildlife, soil, and water quality benefits.

Solar projects are expected to be in operation for at least several decades. To address both short-term and long-term maintenance of a project area, counties may require an operations and maintenance plan as part of the application process. Both Clinton County and Linn County address the same elements in the required operations and maintenance plan:

- Soil erosion and sediment control
- Stormwater management
- Ground cover and buffer areas
- Cleaning chemicals and solvents
- Maintenance, repair, or replacement of facility

In order to monitor compliance with maintenance requirements, Louisa County requires access to a project site:

The Zoning/Building Administrator and any necessary personnel may enter any property for which a special use or building permit has been issued under this ordinance to conduct an inspection to determine whether the conditions stated in the permit have been met as specified by statute, ordinance and code. Failure to provide access shall be deemed a violation of this ordinance.<sup>24</sup>

#### NATIVE VEGETATION MANAGEMENT AND GROUND COVER

Utility-scale solar project sites often occupy multiple acres of land and are projected to cover three million acres across the nation by 2030. To produce 10 percent of Iowa's electricity from solar energy, 13,440 acres would need to be occupied by solar arrays, or 0.04 percent of all of Iowa's farmland. This offers an opportunity for project owners to demonstrate a commitment to environmental stewardship by establishing native vegetation on their solar project site(s). Investing in this practice will create habitat for a variety of at-risk pollinators, including honey bees, bumblebees, and monarch butterflies. For local officials considering the creation of a solar ordinance, this section explores a variety of considerations that can inform sound policy.

Historically, there were 28 million acres of native prairie across the state of Iowa; there is less than one-tenth of one percent of that native prairie remaining. Investments in native vegetation on solar project sites can also help restore habitat for wildlife like ring-necked pheasants, quails, and other grassland birds such as the dickcissel or the sedge wren.



Native prairie plants at the Chisago Solar Site, Chisago County, Minnesota, August 2018. Photo credit to Dennis Schroeder, National Renewable Energy Laboratory. Link: <https://www.flickr.com/photos/nrel/30733115928/in/album-212699605466031/>



Meanwhile, other important environmental outcomes are also achieved through planting native perennial vegetation such as improved soil health and water quality and carbon sequestration. Importantly, the deep root systems of native vegetation can penetrate the soil surface as deep as 15 feet, allowing for increased soil structure and denitrification of water. Improving soil health and water quality also provides developers with the practical benefits of meeting stormwater drainage permit requirements and reducing erosion on project sites.

After considering the potential positive environmental outcomes, Linn County included a requirement within their solar ordinance to establish perennial vegetated ground cover:

Ground cover and buffer areas. Ground around and under solar arrays and in project site buffer areas shall be planted and maintained in perennial vegetated ground cover, and meet the following standards:

- 1) Top soils shall not be removed during development, unless part of a remediation effort.
- 2) Soils shall be planted and maintained in perennial vegetation to prevent erosion, manage run off 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 buffer areas as appropriate for visual screening.
- 3) Seed mixes and maintenance practices should be consistent with recommendations made by qualified natural resource professionals such as those from the department of natural resources, county soil and water conservation service, or natural resource conservation service.
- 4) Plant material must not have been treated with systemic insecticides, particularly neonotinoids.<sup>25</sup>

The benefits of establishing even small areas of native vegetation have been proven to significantly improve pollinator and wildlife populations while helping developers maintain storm water permitting requirements, reduce erosion, and mitigate land use concerns. However, there are many important considerations for developers who wish to install native vegetation on their solar project site. While these recommendations will not typically be included in an ordinance, county officials should educate themselves on the options available to developers and the factors that influence developer implementation. We have included a short primer on those issues as an Appendix to this document.



## INFRASTRUCTURE AND ROAD USE AGREEMENTS

### RECOMMENDATION:

- Counties should put a process in place for assessing and repairing infrastructure before construction begins.

Solar construction crews will utilize roads in and out of a project site. Counties should have a lesser expectation of road impacts from solar development compared to wind development. To address potential impacts to public infrastructure, counties may adopt a road use plan.

Louisa County has adopted the following requirements for a road use agreement:

Road Use Agreements. All routes on county roads that will be used for the construction and maintenance purposes shall be identified on the site plan. All routes for either ingress or egress shall be shown. The solar farm developer must complete and provide a preconstruction baseline survey to determine existing road conditions for assessing potential future damage due to development related traffic. The developer shall provide a road repair plan to ameliorate any and all damage, installation, or replacement of roads that might be required by the developer. The developer shall provide a letter of credit or surety bond in an amount and form approved by the appropriate highway authority(s) officials when warranted. The provision of this subsection shall be subject to the approval of the Louisa County Engineer.<sup>26</sup>

We recommend putting a process in place before construction begins that helps clarify for all parties what specific impacts a developer will be held responsible for and what steps must be taken to mitigate potential damage to roads and other infrastructure.



## DECOMMISSIONING AND SITE RESTORATION

### RECOMMENDATIONS:

- Planning for the responsibility of decommissioning is a prudent step for a county ordinance. We recommend that counties require a decommissioning plan which defines the obligations of the project developer to remove the solar array and restore the land when the project will no longer be used.
- Counties should require the project developer/owner to notify the county of their intent to stop using the facility and that should be the trigger for decommissioning to begin.

Solar ordinances often include a provision requiring the project owner to take responsibility for and bear the costs of decommissioning at the end of a solar project's life. These provisions ensure the county and landowners do not bear the cost of removing solar arrays.

Solar panels typically come with a 20 to 25 year warranty and could be useful for up to 40 years. Depending on the length of a landholder lease, or with a lease extension, projects could be refitted



with new panels once panels have reached their useful life. A county ordinance should include a notice requirement stating that once a developer/owner has determined that the facility will no longer be used, the developer/owner must notify the county of the intent to stop using the facility and to decommission the facility in accordance with the agreed-upon decommissioning plan.

We do not recommend that counties set a time limit for automatic decommissioning, such as no production for one (1) year, because as renewable penetration increases some renewable facilities may be used only as "peaker" facilities on days of extremely high electricity demand. Just because a facility is not producing electricity does not mean it is not being used as a back-up resource by the utility.

The following decommissioning example is from Linn County:

Decommissioning and site reclamation plan.

a. The application must include a decommissioning plan that describes the anticipated life of the utility scale 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.

b. 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.

c. Restoration or reclamation activities shall include, but not be limited to, the following:

1. Restoration of the pre-construction surface grade and soil profile after removal of structures, equipment, graded areas and access roads.
2. Re-vegetation of restored soil areas with crops, native seed mixes, plant species suitable to the area, consistent with the county's weed control plan.
3. For any part of the energy project 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 use of remaining structures must be in conformance with the regulations in effect at that time.

## OTHER CONSIDERATIONS

### NOISE

Inverters, the equipment that convert direct current (DC) electricity into alternating current (AC) electricity, can produce a soft sound during the daytime when the solar array is producing energy. Noticeable noise is not a common or expected impact and any noise should be imperceptible to





neighboring properties even without specific noise provisions.

We do not recommend adding standards for noise. Minimum setback requirements should sufficiently address these issues without adding specific, separate provisions for noise.

### SCREENING

Some counties have chosen to adopt screening requirements in conjunction with setbacks. Counties should consider if screening requirements would be arbitrary and what, if any, other uses currently require screening. According to the National Renewable Energy Laboratory (NREL):

While aesthetic requirements are appropriate for historic districts, requiring solar energy systems to be screened from public view adds costs, can cause shading, and may prevent many installations.<sup>27</sup>

We do not recommend that counties adopt screening provisions or requirements.

### GLARE

The American Planning Association advises that “[s]ome residents may express concerns that glare from solar collectors will be either a public or private nuisance. However, because they are constructed of dark-colored materials and covered with anti-reflective coatings, new solar PV and thermal systems typically reflect as little as 2 percent of incoming sunlight.”<sup>28</sup>

Similarly, a summary of research from the National Energy Research Laboratory states, “Local objections to proposed solar photovoltaic (PV) installations sometimes include concerns that the modules will cause glare that could impact neighbors or aviation. Research on this subject demonstrates that PV modules exhibit less glare than windows and water. Solar PV modules are specifically designed to reduce reflection, as any reflected light cannot be converted into electricity. PV modules have been installed without incident at many airports.”<sup>29</sup>

Given how solar panels are constructed, glare or reflected light is not typically a major issue. Counties wishing to address this low-risk potential impact can include a provision in their ordinance, such as Clinton County and Linn County have:

All solar panels must be constructed to minimize glare or reflection onto adjacent properties and adjacent roadways and must not interfere with traffic, including air traffic, or create a safety hazard.<sup>30,31</sup>

We do not recommend glare provisions in a solar ordinance. However, local or federal authorities may require a glare study that shows the potential impact to the surrounding area, particularly on infrastructure like airports and roadways. For example, the Federal Aviation Administration (FAA) required the City of Ames to conduct a glare study for its community solar project as a result of its proximity to an airport. If the study indicates that there is potential for glare, a project developer

should submit a mitigation plan for glare produced by a system. Such a study with recommended mitigation is preferable to a blanket screening requirement for solar, which adds unnecessary upfront and ongoing expense.

### PRIME FARMLAND

As the development of large-scale solar generation becomes more common, land taken out of production can increase concerns over the impact to prime farmland. To produce 10 percent of Iowa's electricity from solar energy, 13,440 acres would need to be occupied by solar arrays, or just 0.04 percent of all of Iowa's farmland.

While the placement of solar panels may limit agricultural uses for prime farmland, the construction and operation of a solar energy system typically has less impact than other forms of development such as residential or commercial development. Once a system has been decommissioned and removed, farmland can be returned to an agricultural use with minimal reclamation. County officials should consider the potential for combining solar energy systems with other uses that may benefit agricultural operations, such as creating shade for livestock or habitat for pollinators and other wildlife.

We do not recommend any provisions that prohibit solar as a use on prime farmland. If a county already has a provision that prohibits certain uses on designated prime farmland, they may consider adding solar as an acceptable use, especially in conjunction with an additional use like the creation of native prairie or habitat.



## CONCLUSION

For counties considering an ordinance for utility-scale solar, a well-drafted and balanced solar siting ordinance is important. Our review of county ordinances across Iowa and neighboring states shows that counties can adopt workable ordinances that enable successful solar development. We have not identified a single model ordinance in any particular county that we recommend in total. Instead, we have identified the strongest parts of different ordinances to include in this paper. Most county ordinances have additional provisions in the adopted ordinances. We have focused on the major provisions critical to the success of an ordinance.

While counties can attract solar development without adopting a specific ordinance, we believe the clarity and predictability that comes from a solar ordinance can be beneficial for the county, its residents, and solar developers.

## ABOUT

The primary authors of this paper are Kerri Johannsen, Jordan Oster, and Steve Guyer of the Iowa Environmental Council and Lu Nelsen and Cody Smith of the Center for Rural Affairs. We appreciate the input and guidance provided by county officials, solar developers, colleagues and others as we researched and drafted this paper.

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### A CLOSER LOOK: BEST PRACTICES FOR COMMUNITY SOLAR

Community solar is a unique model that often involves the construction of a solar array that is much larger than small-scale or residential solar. Although some states allow for independent development of community solar projects by private industry, cities, and nonprofits, such projects cannot currently be developed in Iowa. Community solar in Iowa can only be developed by or for utilities, including municipal utilities.

Typically, community solar projects incorporate methods for community members to participate in the project in some way through a mechanism such as an investment or subscription with the benefits of the project passed along to subscribers. Some considerations for community solar projects are listed below.



City of Cedar Falls community solar project. Photo courtesy of Cody Smith, Center for Rural Affairs.

#### Land selection is key for ground-mounted solar

- Land already owned by the project developer, owner, or off-take customer is preferable, as it eliminates the need for new easements and may mitigate several siting issues.
- Several factors contribute to cost efficiency when considering a community solar project:
  - Proximity to high intensity energy users.
  - Strong local demand for electricity, especially produced from renewable resources.
  - Access to the electric grid, allowing for interconnection without building substantial new infrastructure.

- The type of site also contributes to cost efficiency over the long-term—a square or rectangular parcel of land and in-line set-up helps streamline ongoing management like mowing and system maintenance.
- Sites should also have easy access, with limited surrounding development or vegetation that may shade a solar energy system.
- Sites should also ideally allow for expansion of a project if demand from consumers increases over time.
- Example:
  - The City of Ames will site their project on a parcel of land already owned by the City that was being leased for farmland.
  - The City of Cedar Falls community solar project currently occupies eight acres of previously undeveloped city property.

#### Alternatives to ground-mounted solar

- Large rooftops such as those on manufacturing facilities or big box retailers may be potential sites for community solar projects. These sites reduce land acquisition concerns associated with selecting a site for a ground-mounted solar system while providing the host with some publicity for participating.
- Siting projects in parking lots in the form of a system mounted on canopies that also offers shade is possible, but there are liability concerns around falling ice damaging vehicles during the winter months.

#### Community involvement in site selection is crucial

- A robust cost-benefit analysis is recommended prior to proposing a community solar project.
- Officials should be sure to engage with a wide range of stakeholders to determine if there are other plans for a selected site or the surrounding area that may impact a future solar energy system.
- Once a project has been proposed, there should be opportunities provided for community members to attend meetings or open houses that allow them to learn more about the project and ask questions.

#### Development and project ownership

- Leasing city land to a private developer and entering into a Power Purchase Agreement can reduce project costs by allowing the developer to take advantage of federal and state tax credits.
- If a municipal utility is seeking a private developer for a community solar project, there should

be a transparent bidding process. Information that may be required in a bid includes:

- Price and term for a power purchase agreement between the developer and the municipal utility.
- Estimate of annual electricity production.
- Performance history for the equipment that will be used in a similar environment.
- Project timeline that lays out anticipated start and completion dates for construction as well as an in-service date for the system.
- Previous experience developing similar projects.

**Example:** Both Cedar Falls and Ames leased their land to a private developer at little to no cost and allowed them to construct the solar farm so the developer could take advantage of the 30% federal investment tax credit, as municipalities are ineligible. Both cities intend to buy back the project at some point.

- A competitive and transparent bidding process is important for project success.

**Example:** The City of Ames included all submitted bids in their report to the city council. Their developer selection was based on the following criteria:

- Price of a 25-year Power Purchase Agreement and estimated project buyout costs.
- Annual production estimates.
- Annual performance estimates.
- Performance history and reliability of the equipment specified for this project in similar environments.



- Strength and experience of the developer's project team and proven expertise of the project team.
- System and component product warranties.
- Developer's proposed project financing capability and structure.
- Project schedule.
- Experience with building at or near an airport location.
- Notably, the federal investment tax credit began a gradual phase-out in 2020, dropping to 26 percent.

#### Adding consumer value

Projects may be designed to allow consumers to invest in a community project in various ways:

- Many community projects offer "shares" that residents can purchase. These typically act as a subscription in the project, paid through an additional charge on a monthly electric bill. In some cases, subscribers are credited an amount determined by the utility for energy produced by the project during the given period.
  - i. The rate associated with a share should be devised in a transparent manner, clearly demonstrating the method used to determine the total cost to consumers.
  - ii. **Example:** The city of Ames charges a \$300 cost for a consumer subscription, or "power pack," which is a subscription to one-half of one panel for 20 years. The power packs are expected to return average monthly credits of \$1 to \$2 for the duration of the 20-year contract. Payback is predicted to take anywhere between 16 and 18 years.
- In other models, consumers are allowed to purchase and own panels that are part of the community solar systems.
  - i. This option may allow for consumers to access available tax credits while investing in a community project, often paying a monthly maintenance fee for upkeep of the panel(s).
  - ii. In some cases, consumers that choose this option may be credited for the full production of their panel(s) as though they were located behind their electric metering, as is the case with net metered residential solar.
- Community projects often feature a means of unsubscribing or selling back shares/panel(s). This often reduces anxiety associated with subscribing to a project, as residents are not tied to a subscription if they choose to move to a different area.

## APPENDIX: NATIVE VEGETATION MANAGEMENT FOR SOLAR - ADDITIONAL CONSIDERATIONS

Across the U.S., the solar industry is booming. Solar project sites often occupy several acres of land and are projected to cover three million acres by 2030.<sup>1</sup> To produce 10 percent of Iowa's electricity from solar energy, 13,440 acres would need to be occupied by solar arrays—offering an opportunity for project owners to demonstrate their commitment to environmental stewardship.<sup>1</sup>

While the full detail included below may not be appropriate for inclusion in a solar ordinance, we hope it can serve to inform policymakers about the developer considerations which accompany the adoption of native vegetation on solar project sites.

### INCREASING PROJECT VALUE:

In addition to providing habitat for wildlife and pollinators, investments in native vegetation on solar project sites provide ancillary benefits such as improved soil health and water quality, while also sequestering carbon.

### PLANNING, COST, AND SEEDING:

#### Planning

Planning at least one year before the seed goes into the ground is recommended. This provides adequate time to reach out for technical assistance, review and select a site, determine the existing dominant vegetation (if any), conduct two or more herbicide applications to suppress existing vegetation if needed, and gather quotes for a native seed mix.<sup>8</sup>

#### Cost

When considering total project cost, the key variable is the number of acres that will be established. Depending on project size, different management approaches may be necessary.<sup>10</sup> **Per acre in Iowa, \$500-\$1,000 is a reasonable range for most projects.<sup>9</sup>**

**Best practice:** Include native vegetation in the initial planning process of a project. Incorporating this desired outcome into the process will allow for a holistic consideration of all factors including soil characteristics, construction, management, establishment, and more.

#### Seeding

Timing is key to success—frost-seeding between November 1 and June 1 is ideal for maximum germination and ensuring stand establishment through a full growing season.<sup>10,11</sup> August and late summer plantings should be avoided as a stand won't have enough time to establish before cold temperatures. To establish the needed firm seedbed, conventional methods include disking at least twice and cultipacking, although this is dependent upon the conditions of each site.<sup>10</sup> Seeding methods include broadcast, drill, and hand-broadcast techniques. Native grass seeds need good seed-to-soil contact and should be planted no deeper than 1/4" in the soil. Ideally, native prairie seeds should rest on top of the soil.

**Best practice:** A site may take time to establish aesthetic native vegetation. Signage that says "Pollinator habitat in progress" can mitigate public concern. Keep in mind that each seedbed is different and may not need disking or plowing—these decisions should be made in consultation with a conservation professional to review site-specific information such as existing vegetation, moisture levels, and soil type.

### MANAGEMENT AND CONSTRUCTION:

#### Construction

Being flexible when it comes to the height of a solar energy system is important for project success. A seed mix should include plants that don't reach a peak height that could shade the low, tilted edge of ground-mounted solar energy systems unless developers plan to use strategic mowing or livestock grazing (i.e. sheep) to avoid interfering with project efficiency.

**Best practice:** Although project managers may have to strip-mow to maintain project efficiency, it is important to remember that taller native vegetation provides better habitat for wildlife and pollinators. Striking a balance between quality and height can equalize cost.

#### Management

**Year one:** Regular mowing (three to four times) during the first growing season prevents weeds from shading out seedlings and going to seed. The first mowing should be at a height of four to six inches soon after seeding; the next two mowings should be at a height no less than eight inches.

**Year two:** With a successful planting, years subsequent to establishment provide the opportunity for less maintenance, needing only an occasional disturbance and limited mowing to encourage desirable species.<sup>16</sup>

**Years three and four:** Mowing and baling the plant residue approximately every three years is the preferred management option for solar project sites.<sup>8</sup>

#### Timing impacts wildlife and pollinators

After year two, avoid or minimize mowing between April 1 and August 1 to minimize impacts during the nesting season of upland birds such as pheasants and quail. Delaying mowing to late September facilitates a more welcoming habitat for migrating pollinators such as monarch butterflies, as the highest population of Monarch eggs is often found on milkweed plants in late July and early August.

<sup>10</sup> Spot mowing and/or herbicide application could be used during this period if necessary to control invasive plants.

**Best practice:** Every site is unique and all timelines should be adjusted to the needs of a project. Experts suggest evaluating the ratio of native species to weeds and invasive vegetation before making mowing and other management decisions. If native vegetation is struggling to establish a strong stand, mowing is likely necessary; if the opposite is occurring, mowing may not be in a site's best interest.

## SELECTING A SEED MIX:

The height of the solar panels is a primary consideration when selecting a seed mix. Other factors include project location, soil type and moisture, the species of vegetation that are native to the area, planned management of the site, and more. Consider which desired outcomes the native vegetation is intended to achieve such as providing wildlife habitat, increasing pollinator populations, or reducing erosion. Developers should aim for a ratio of grasses to forbs when selecting a seed mix.

**Best practice:** Wildlife generally responds more to structure of vegetation (the ratio of grasses to forbs) than specific plant species; a seed mix closer to 30 percent grasses and 70 percent forbs is recommended for upland nesting birds.<sup>21</sup> Some species of native vegetation are crucial for pollinators; monarch butterflies only lay eggs on milkweed plants. Bees, adult monarchs, and other pollinators rely on a diversity of flowering plants that provide blooms during all periods of the growing season (March to October).

Figure A shows a recommended native seed mix for a solar project site in central Iowa.<sup>200</sup>

FIGURE A

Short species prairie seed mix for medium-dry soils in central Iowa			
Botanical Name	Common Name	Botanical Name	Common Name
<i>Asclepias tuberosa</i>	Butterfly Weed	<i>Ceanothus americanus</i>	New Jersey Tea
<i>Saphira alba</i>	White Wild Indigo	<i>Rosa arkansana</i>	Wild Rose
<i>Chamaecrista fasciculata</i>	Partridge Pea	<i>Astragalus canadensis</i>	Lead plant
<i>Cimicifuga racemosa</i>	Lemon leaf Ceanothus		
<i>Coreopsis seminata</i>	Prairie Coreopsis	<i>Eutrochium dubium</i>	Side-sage Grass
<i>Dalea candida</i>	White Prairie Clover	<i>Centaurea jacea</i>	Purple Owl Sedge
<i>Dalea purpurea</i>	Purple Prairie Clover	<i>Koeleria macrantha</i>	June Grass
<i>Oxyechia rigida</i>	Prairie Cinquefoil	<i>Schizanthus scopulorum</i>	Little Bluestem
<i>Trifolium yuccifolium</i>	Rudbeckia Minder		
<i>Caprilla canadensis</i>	Flowering Spurge		
<i>Urtica dioica</i>	Stinging Nettle		
<i>Pedicularis canadensis</i>	Wood Betony		
<i>Heisteria ciliata</i>	Purple Beech		
<i>Thymophylla canadensis</i>	Plantain		
<i>Aster multiflorus</i>	Black-eyed Susan		
<i>Ruellia humilis</i>	Wild Petunia		
<i>Solidago speciosa</i>	Shiny Goldenrod		
<i>Symphoricarpos racemosa</i>	Blue Star		
<i>Trifolium repens</i>	White Clover		
<i>Verbena stricta</i>	Hoary Verbena		
<i>Zizia aurea</i>	Golden Alexander		
<i>Asclepias syriaca</i>	Common Milkweed		
<i>Symphoricarpos racemosa</i>	Heath Aster		
<i>Symphoricarpos racemosa</i>	Pink Aster		
<i>Cornus alba</i>	Chokeberry		
<i>Isodesmos helianthus</i>	Early Sunflower		
<i>Desmodium canadense</i>	Shiny Tick Trefoil		

Courtesy of Story County Conservation

When crafting local solar ordinances, we recommend that officials consider the intended outcomes and goals for requiring native vegetation. For example, Linn County's ordinance lists their intended goals like soil health, erosion reduction, and water quality. They also favor bee and other pollinator populations by restricting the use of potentially harmful pesticides.

Additionally, it is recommended that local officials weigh the factors developers are considering when contemplating the establishment of native vegetation, such as management, construction, planning, and other concerns—only some of which were listed above.

Local officials may also seek assistance with questions on these topics from organizations such as the Center for Rural Affairs, Audubon Society, Pheasants Forever Native Plants Program, The Iowa Monarch Consortium at Iowa State University, and the STRIPS project at Iowa State University.

## APPENDIX ENDNOTES

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<sup>20</sup> Prepared by Story County Conservation.





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# DECOMMISSIONING SOLAR ENERGY SYSTEMS RESOURCE GUIDE



A RESOURCE GUIDE BY HEIDI KOLBECK-URLACHER,  
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Decommissioning Solar Energy Systems  
Resource Guide

By:  
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# DECOMMISSIONING SOLAR ENERGY SYSTEMS RESOURCE GUIDE

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June 2022

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When solar projects reach the end of their expected performance period, there are several management options. They include extending the performance period through reuse, refurbishment, or repowering of the facility or fully discontinuing operations and decommissioning the project. | Photo by Rhea Landholm

## I. INTRODUCTION

Falling equipment costs coupled with increased demand for clean energy have led to a rapid rise in solar development over the past decade, a trend expected to continue. Although solar accounted for 3% of U.S. electricity in 2020, the U.S. Energy Information Administration projects that number will reach 20% by 2050.<sup>1</sup> In 2022 alone, solar will account for nearly half of all new electric generating capacity.<sup>2</sup>

Solar projects are often located in rural areas and can provide numerous benefits to nearby communities, including lease payments to landowners, tax revenue to fund infrastructure and services, and the creation of both permanent and temporary jobs.

County officials are typically responsible for enacting siting or zoning standards to help ensure solar

development is supported by local residents. This can include planning for the eventual decommissioning of energy projects that have reached the end of their life cycles.

## II. UNDERSTANDING SOLAR PROJECT END-OF-LIFE OPTIONS

Solar panel lifespan is 25 to 35 years.<sup>3</sup> Since approximately 75% of all U.S. solar capacity has been installed in the past five years, most panels are still operational and have not been decommissioned yet.<sup>4</sup>

When solar projects reach the end of their expected performance period, there are several management options. They include extending the performance period through reuse, refurbishment, or repowering of the facility or fully discontinuing operations and decommissioning the project.

1 Francis, Mickey, and Manusawee Sulenta. "Solar generation was 3% of U.S. electricity in 2020, but we project it will be 20% by 2050." U.S. Energy Information Administration, Nov. 16, 2021, [eia.gov/todayinenergy/detail.php?id=50357](https://eia.gov/todayinenergy/detail.php?id=50357). Accessed April 2022.

2 Fasching, Elsie, and Suparna Ray. "Solar power will account for nearly half of new U.S. electric generating capacity in 2022." U.S. Energy Information Administration, Jan. 10, 2022, [eia.gov/todayinenergy/detail.php?id=50818](https://eia.gov/todayinenergy/detail.php?id=50818). Accessed April 2022.

3 Huang, Susan, et al. "Solar Energy Technologies Office Photovoltaics End-of-Life Action Plan." U.S. Department of Energy, Office of Energy Efficiency & Renewable Technology, March 2022, [eere.energy.gov/sites/default/files/2022-03/Solar-Energy-Technologies-Office-PV-End-of-Life-Action-Plan\\_0.pdf](https://eere.energy.gov/sites/default/files/2022-03/Solar-Energy-Technologies-Office-PV-End-of-Life-Action-Plan_0.pdf). Accessed April 2022.

4 Ibid.

## A. EXTENDING THE PERFORMANCE PERIOD: REUSE, REFURBISHMENT, AND REPOWERING

In some cases, photovoltaic modules can be reused or refurbished to extend the system's performance period.<sup>5</sup> If equipment is still in working order, one possibility is to extend leases, permits, and interconnection agreements to continue operation. This requires no capital investment, but there are costs associated with maintaining aged equipment.<sup>6</sup>

- **Reuse** of the system's photovoltaic modules is the most economically and environmentally beneficial option and can provide opportunities for revenue or tax savings.<sup>7</sup> Research has shown that solar panels degrade at a rate of 0.5% per year, which means that by year 20 a panel can be expected to produce 90% of the electricity it did in year 1.<sup>8</sup>
- **Refurbishment** involves making necessary repairs to extend the lifespan of the system's older equipment. Refurbishing older equipment can be challenging due to the difficulty of finding parts and lack of expertise in working with older technologies.<sup>9</sup>

- **Repowering** involves redesigning the system and installing new arrays and inverters to rebuild or replace the power source, and can cost about 80% of the total plant value. A repowered solar system is new in most respects but can leverage existing land-use, permitting, and utility interconnections.<sup>10</sup>

## B. FULL DECOMMISSIONING: RECYCLING AND DISPOSAL OF SOLAR PANELS

Full decommissioning indicates the solar facility will be closed, all photovoltaic equipment will be removed, and land will be restored to its original condition.<sup>11</sup> Disassembly of the solar system mirrors assembly, only in reverse. It will include removing modules and sorting components by material type. Major pieces of equipment might be sourced for spare parts or sent for recycling. Labor cost of decommissioning can be half that of installation.<sup>12</sup>

- **Recycling** solar panels decreases waste and allows for the recovery of high-value and energy-intensive materials. Solar panels typically consist of glass, aluminum, copper, silver, and semiconductor materials that can be successfully recovered. By weight, more than 80% of a typical solar panel is glass and aluminum, both of which are common and easily recycled materials.<sup>13</sup>

Solar recycling technology is still a developing field. At present most recycling happens at existing glass recycling facilities, which can recover about 78% of materials.<sup>14</sup> It is anticipated that

10 Ibid.

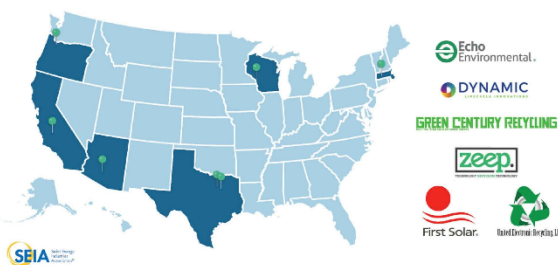
11 Ibid.

12 Curtis, Taylor, et al. "Best Practices at the End of the Photovoltaic System Performance Period." National Renewable Energy Laboratory, February 2021, [nrel.gov/docs/fy21osti/78678.pdf](https://nrel.gov/docs/fy21osti/78678.pdf). Accessed April 2022.

13 "End-of-Life Management for Solar Photovoltaics: Recycling." Solar Energy Industries Association, January 2020, [seia.org/sites/default/files/2020-11/SEIA-Recycling-Program-Factsheet-January%202020%20final.pdf](https://seia.org/sites/default/files/2020-11/SEIA-Recycling-Program-Factsheet-January%202020%20final.pdf). Accessed April 2022.

14 "Solar Photovoltaics: End-of-Life Management Infographic." Electric Power Research Institute, March 18, 2021, [epri.com/research/products/000000003002021132](https://epri.com/research/products/000000003002021132). Accessed December 2021.

FIGURE 1: SOLAR ENERGY INDUSTRIES ASSOCIATION PV RECYCLING PARTNER NETWORK



Source: Solar Energy Industries Association

with emerging technologies the amount recovered will increase. Currently, recycling may be more costly than other options.<sup>15</sup>

The Solar Energy Industries Association's (SEIA) PV Recycling Working Group has been preparing for solar recycling needed in coming years by developing the SEIA PV Recycling Partner Network. See Figure 1 for a map of current locations.

- **Disposal** of solar system equipment by landfill is the least expensive and most accessible option, although it presents obvious environmental drawbacks.<sup>16</sup> Disposal of solar panels should be done with careful consideration of federal, state, and local solid waste requirements.<sup>17</sup> Some states, such as North Carolina, Washington,

and California, have enacted specific policies around the management of solar panel waste.<sup>18</sup>

Testing on solar panels indicates different varieties of panels contain different metals in the semiconductor and solder. Some of these metals, such as lead and cadmium, may be considered hazardous waste if present in high enough quantities.<sup>19</sup> If a solar panel contains hazardous materials, those components are subject to hazardous waste regulation under the Resource Conservation and Recovery Act of 1976 (RCRA). Because recycling is encouraged over disposal, the RCRA does provide certain conditional exclusions for the recycling of solar panels containing hazardous waste.<sup>20</sup>

15 Ibid.

16 Ibid.

17 Curtis, Taylor, et al. "Best Practices at the End of the Photovoltaic System Performance Period." National Renewable Energy Laboratory, February 2021, [nrel.gov/docs/fy21osti/78678.pdf](https://nrel.gov/docs/fy21osti/78678.pdf). Accessed April 2022.

18 "End of Life Solar Panels: Regulations and Management." U.S. Environmental Protection Agency, Sept. 16, 2021, [epa.gov/hw/end-life-solar-panels-regulations-and-management](https://epa.gov/hw/end-life-solar-panels-regulations-and-management). Accessed April 2022.

19 Ibid.

20 Ibid.

## III. PLANNING FOR DECOMMISSIONING

Decommissioning requirements can be set by states and counties. Landowners and developer agreements may set additional requirements. It is prudent for local governments to plan ahead for solar decommissioning and create ordinances that spell out expectations and obligations. This ensures that financial responsibility for decommissioning falls to the project owner and not the county and landowners.

Because the majority of solar installations are decades away from being retired, project decommissioning plans may need to be revised over time. Periodic plan reviews allow local governments to accommodate necessary changes in decommissioning cost estimates, technology changes, and the availability of recycling services.

### A. COMPONENTS OF A DECOMMISSIONING PLAN

Decommissioning plans often include:<sup>21, 22, 23, 24</sup>

- Estimated lifespan of the project.
- Defined conditions upon which decommissioning will be initiated, such as the end of lease, inoperation of the facility for a certain period of time, or a pre-identified end date.

21 "Decommissioning Solar Panel Systems: Information for local governments and landowners on the decommissioning of large-scale solar panel systems." New York State Energy Research and Development Authority, [nysed.ny.gov/-/media/Divisions/NYSun/files/Decommissioning-Solar-Systems.aashx](https://nysed.ny.gov/-/media/Divisions/NYSun/files/Decommissioning-Solar-Systems.aashx). Accessed April 2022.

22 "EERA Recommendations on Review of Solar and Wind Decommissioning Plans (Commission Docket Number E999/M-17-123)." Minnesota Department of Commerce, March 16, 2020, [dcomerc.state.mn.us/edockets/searchDocuments.do?method=showFop&id=documentId-%7b1624E870-0000-CD11-98E8-4FC10D5E58B7%7d&documentTitle=20203-161292-01](https://dcomerc.state.mn.us/edockets/searchDocuments.do?method=showFop&id=documentId-%7b1624E870-0000-CD11-98E8-4FC10D5E58B7%7d&documentTitle=20203-161292-01). Accessed May 2022.

23 Curtis, Taylor, et al. "A Survey of Federal and State-Level Solar System Decommissioning Policies in the United States." National Renewable Energy Laboratory, December 2021, [nrel.gov/docs/fy22osti/79650.pdf](https://nrel.gov/docs/fy22osti/79650.pdf). Accessed April 2022.

24 Curtis, Taylor, et al. "Best Practices at the End of the Photovoltaic System Performance Period." National Renewable Energy Laboratory, February 2021, [nrel.gov/docs/fy21osti/78678.pdf](https://nrel.gov/docs/fy21osti/78678.pdf). Accessed April 2022.

- Identification of the party responsible for decommissioning.
- Statement defining how notification will be made of intent to start the decommissioning process.
- Description of any agreement made with the landowner regarding decommissioning.
- Plans and schedule for updating the decommissioning plan over time.
- Decommissioning tasks and timing, including:
  - Removal of all equipment, structures, fencing, roads, and foundations.
  - Restoration of property to condition prior to solar development.
  - The timeframe for completion of decommissioning activities.
- Detailed decommissioning cost estimates prepared by a knowledgeable independent party. This may or may not include the salvage value of solar equipment and infrastructure.
- A description of expected impacts on natural resources.
- Financial surety, which may be established through different financial instruments, such as trusts or escrow accounts, bonds, letters of credit, or other types of agreements.

*Nebraska is one of the few states with a state-level decommissioning requirement. Nebraska Revised Statute 70-1014.02 requires that private electric suppliers comply with any decommissioning requirements adopted by local governmental entities, submit a decommissioning plan, bear all costs of decommissioning, and post a security bond or other instrument within 10 years of commercial operation securing the costs of decommissioning the facility.<sup>25</sup>*

### B. ESTIMATING DECOMMISSIONING COSTS

Because few solar projects have yet to be decommissioned, cost estimates vary widely. Differences depend on numerous factors specific to the project,

25 "Nebraska Revised Statute 70-1014.02." Nebraska Legislature, [legis.lsr.state.ne.gov/laws/statutes.php?statute=70-1014.02](https://legis.lsr.state.ne.gov/laws/statutes.php?statute=70-1014.02). Accessed May 2022.



site, calculation methods, local government requirements, and whether salvage value is included as part of the total. Using local, independent professionals, such as third-party engineers, to develop a project-specific decommissioning cost estimate is recommended.

1. DECOMMISSIONING COST EXAMPLES

- The New York State Energy Research and Development Authority (NYSERDA) estimates \$30,000 per megawatt in present day costs.<sup>26</sup> See Table 1 for NYSEDA's sample list of decommissioning costs for a 2 MW solar installation.<sup>27</sup>
- A 2018 Minnesota Department of Commerce solar and wind decommissioning working group estimated the net costs (total less salvage value) of solar facilities at \$21,700 to \$56,300 per megawatt.<sup>28</sup>
- Decommissioning costs for South Dakota's first two proposed utility-scale solar projects are estimated between \$9,090 and \$18,148 per megawatt.<sup>29, 30</sup>

TABLE 1: SAMPLE LIST OF DECOMMISSIONING TASKS AND ESTIMATED COSTS FOR A 2 MW SOLAR INSTALLATION

Tasks	Estimated cost
Remove rack wiring	\$2,459
Remove panels	\$2,450
Dismantle racks	\$12,350
Remove electrical equipment	\$1,850
Breakup and remove concrete pads or ballasts	\$1,500
Remove racks	\$7,800
Remove cable	\$6,500
Remove ground screws and power poles	\$13,850
Remove fence	\$4,950
Grading	\$4,000
Seed disturbed areas	\$250
Truck to recycling center	\$2,250
Current total	\$60,200
Total after 20 years (2.5% inflation rate)	\$98,900

Source: New York State Energy Research and Development Authority

B. FINANCIAL ASSURANCE MECHANISMS

Some local governments may decide to require financial mechanisms, such as trusts, escrow accounts, bonds, or letters of credit, to ensure appropriate decommissioning and reclamation. Requiring financial assurance is a tradeoff, as it provides additional protection for local governments, but may increase overall project costs, which could deter development.<sup>31</sup> If requiring financial assurance, a more favorable approach for developers is if assurances can be paid over time rather than prior to project operation, as the assurance may be

absorbed as operating costs rather than upfront capital cost.<sup>32</sup>

For example, Nebraska statute requires suppliers to post a security bond or other instrument within 10 years of a commercial operation securing the costs of decommissioning the facility.<sup>33</sup> Guidance from the Minnesota Department of Commerce Energy Environmental Review and Analysis (EERA) unit recommends that financial assurances be implemented in a stepwise manner with initial payments by year 10 and increased over time to ensure full funding no later than the end of the power purchase agreement.<sup>34</sup>

IV. RECOMMENDATIONS

We recommend that counties:

- Require project developers to submit a decommissioning plan that defines the obligations of the project developer to remove the solar array and restore the land when the project is retired.
- Require the project developer to notify the county of its intent to stop using the facility once it has been determined the system will be fully retired. This notification should serve as the trigger for decommissioning to begin. Both the manner of notification and the deadline for decommissioning to occur once notification is given should be defined within the original decommissioning plan.
- Ensure that decommissioning plans include expected timelines for completion of tasks.

For example, specifying deadlines for removal of equipment and completion of site reclamation.

- Include a provision that the project owner is responsible for the costs of decommissioning, ensuring the county and landowners do not bear these costs.
- Work with developers to ensure decommissioning cost estimates are made by a third-party professional who can provide a location and project-specific cost estimate, and plan for these cost estimates to be reviewed every 5 to 10 years to accommodate changes.
- Encourage recycling or repurposing of solar components rather than disposal in landfills.

26 "Decommissioning Solar Panel Systems: Information for local governments and landowners on the decommissioning of large-scale solar panel systems," New York State Energy Research and Development Authority, [nyseda.ny.gov/-/media/Migrated/NYSun/files/Decommissioning-Solar-Systems.aspx](https://nyseda.ny.gov/-/media/Migrated/NYSun/files/Decommissioning-Solar-Systems.aspx). Accessed April 2022.

27 Ibid.

28 "Solar and Wind Decommissioning Working Group, Report and Recommendations," Minnesota Department of Commerce, August 2018, [cfdockets.web.commerce.state.mn.us/cfdockets/search/Documents.do?method=showPoup&documentId=%7BF0DC9065-0000-C734-8DCC-76C867A06CD8%7D&documentTitle=20188-146145-02](https://cfdockets.web.commerce.state.mn.us/cfdockets/search/Documents.do?method=showPoup&documentId=%7BF0DC9065-0000-C734-8DCC-76C867A06CD8%7D&documentTitle=20188-146145-02). Accessed May 2022.

29 "Lookout Solar Project: Application to the South Dakota Public Utilities Commission for an Energy Facility Permit," South Dakota Public Utilities Commission, December 2018, [puc.sd.gov/commission/dockets/clectric/2018/c118-059/application.pdf](https://puc.sd.gov/commission/dockets/clectric/2018/c118-059/application.pdf). Accessed May 2022.

30 "Appendix D: Decommissioning Plan, Wild Springs Solar LLC," South Dakota Public Utilities Commission, May 15, 2020, [puc.sd.gov/commission/dockets/clectric/2020/c120-018/AppendixD.pdf](https://puc.sd.gov/commission/dockets/clectric/2020/c120-018/AppendixD.pdf). Accessed May 2022.

31 "Decommissioning Solar Panel Systems: Information for local governments and landowners on the decommissioning of large-scale solar panel systems," New York State Energy Research and Development Authority, [nyseda.ny.gov/-/media/Migrated/NYSun/files/Decommissioning-Solar-Systems.aspx](https://nyseda.ny.gov/-/media/Migrated/NYSun/files/Decommissioning-Solar-Systems.aspx). Accessed April 2022.

32 Curtis, Taylor, et al. "A Survey of Federal and State-Level Solar System Decommissioning Policies in the United States," National Renewable Energy Laboratory, December 2021, [nrel.gov/docs/2022osti/79650.pdf](https://nrel.gov/docs/2022osti/79650.pdf). Accessed April 2022.

33 "Nebraska Revised Statute 70-1014.02," Nebraska Legislature, [nebraskalegislature.gov/laws/statutes.php?statute=70-1014.02](https://nebraskalegislature.gov/laws/statutes.php?statute=70-1014.02). Accessed May 2022.

34 "EERA Recommendations on Review of Solar and Wind Decommissioning Plans (Commission Docket Number E999/M-17-123)," Minnesota Department of Commerce, March 16, 2020, [cfdockets.web.commerce.state.mn.us/cfdockets/search/Documents.do?method=showPoup&documentId=%7B1024E570-0000-CD11-98E8-4EC4D05E58E7%7D&documentTitle=20203-161292-01](https://cfdockets.web.commerce.state.mn.us/cfdockets/search/Documents.do?method=showPoup&documentId=%7B1024E570-0000-CD11-98E8-4EC4D05E58E7%7D&documentTitle=20203-161292-01). Accessed May 2022.

About the Center for Rural Affairs

Established in 1973, the Center for Rural Affairs is a private, nonprofit organization with a mission to establish strong rural communities, social and economic justice, environmental stewardship, and genuine opportunity for all while engaging people in decisions that affect the quality of their lives and the future of their communities.



## Policy Approaches for Dual-Use and AgriSolar Practices

By Heidi Kolbeck-Urlacher, Center for Rural Affairs  
April 2023



CENTER for  
RURAL AFFAIRS

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#### Key Take-aways

### INTRODUCTION

As demand for clean energy increases, solar deployment is expected to rise. Because utility-scale solar requires considerable land use, many state and local governments are prudently discussing the impact future solar development will have on agricultural lands. The practice of dual-use solar, which refers to allowing two uses to be accomplished in the same space, can



address concerns about solar on agricultural land.<sup>1</sup>

Agrivoltaics, also called agrivoltaics, is the co-location of agriculture and solar within the landscape. It includes solar co-located with crops, grazing, beekeeping, pollinator habitat, aquaculture, and farm or dairy processing. In addition to photovoltaics, it also includes concentrated solar installations.<sup>2</sup> The practice of combining agriculture and solar energy systems can provide numerous economic and environmental benefits. This includes improving economic viability for landowners and agricultural entities, providing beneficial ecological services, and expanding siting

1 Mariëb, Dugan. "Dual-use Solar in the Pacific Northwest: A Way Forward." Renewable Northwest, 2019. Accessed March 2023.

2 Personal communication, Stacie Peterson, Energy Program Director, National Center for Appropriate Technology, March 2023.



opportunities for solar deployment.<sup>3</sup>

The purpose of this report is to provide decision makers and others an overview of policy approaches to combining solar with agriculture and offer considerations on how regulations can facilitate dual-use.

First, we will look at land use and solar, examining the impact expected by the rapid increase of solar deployment in the near future, and the varying level of responses occurring around clean energy siting regulations and guidance. Next, we will explore the types of dual-use applications and the benefits associated with them, and then move into an overview of policy mechanisms at the federal, state, and local levels that facilitate dual-use. Lastly, we will take a closer look at how local governments have the most impact on solar development, and offer considerations for decision-makers who are interested in creating ordinances or incentives around dual-use.

### LAND USE AND SOLAR

#### How Much Land Will Be Needed?

As the U.S. moves toward setting ambitious decarbonization goals, solar energy is

forecasted to grow considerably. Based on solar deployment scenarios by the U.S. Department of Energy (DOE), ground-based solar technologies may require a land area equivalent to 0.5% of the contiguous U.S. However, it is estimated that this requirement could be met using less than 10% of already disturbed or contaminated lands.<sup>4</sup>

By county, it does not appear that current or planned solar projects would require significant land allocation as a proportion of local area. In an analysis of all counties in the contiguous U.S., the Great Plains Institute found that existing solar development comprises on average 0.04% of land per county and that if all proposed solar projects were built, development would average 0.22% of land per county. As of 2021, no county in the U.S. had more than 4% of total county area in solar development. In contrast, cultivated lands comprise up to 75% of the total county area in much of the central Midwest.<sup>5</sup>

Some state and local governments have created restrictions around using farmland for solar development. However, clean energy development does not appear to pose an immediate threat to the availability of farmland. As of 2022, Iowa had 30.6 million acres of farmland, about 17.5 million of which meets the U.S. Department of Agriculture's (USDA) definition of "prime."<sup>6,7</sup> If all of the 2,290 MW of proposed solar projects in Iowa were sited on prime farmland, it would use only 0.11% of prime farmland in the state.<sup>8</sup> According to Minnesota Solar Pathways, powering 70% of Minnesota's electrical load by 2050 would require adding 22 gigawatts of solar,

4 "Solar Futures Study Fact Sheet." U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, September 2021. Accessed March 2023.

5 Wyratt, Jessi, and Maggie Kristian. "The True Land Footprint of Solar Energy." Great Plains Institute for Sustainable Development, Sept. 14, 2021. Accessed March 2023.

6 "Prime Farmland Definition." Natural Resources Conservation Service, March 2015. Accessed March 2023.

7 "Iowa Solar and Agriculture Fact Sheet." Clean Grid Alliance. Accessed March 2023.

8 Ibid.



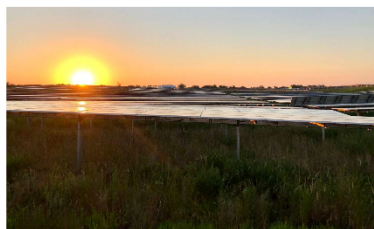
which would use 220,000 acres of land. Even if all of this solar were to be sited exclusively on prime farmland, it would still only use 1.32% of prime farmland in the state.<sup>9</sup>

#### Alternatives to Land-use Restrictions

Even though the land needed for solar development is proportionally low, many state and local governments have enacted or are considering enacting restrictions on clean energy development on farmland. In Iowa, some counties have considered using Corn Suitability Ratings (CSR) to restrict development,<sup>10,11</sup> and state legislators have introduced bills prohibiting solar development on farmland.<sup>12,13,14</sup>

In Minnesota, the Public Utilities Commission's administrative rules restrict large electric generation plants from being located on prime farmland.<sup>15</sup> In Midwest states where a large percentage of the land qualifies as farmland, blanket restrictions such as these can severely impact opportunities for clean energy development.

However, some organizations concerned about the land use impacts of clean energy development have developed siting guidance that mitigates impacts to sensitive areas. For



example, the American Farmland Trust, an organization dedicated to the preservation of farmland, has created a series of Smart Solar principles, which they believe meet three goals: accelerate solar energy development, strengthen farm viability, and safeguard land well-suited for farming and ranching.<sup>16</sup>

These principles include:<sup>17</sup>

#### Prioritize solar siting on buildings and land not well suited for farming

Including buildings, irrigation ditches, brownfields or other marginal lands.

#### Safeguard the ability for land to be used for agriculture

If developed on farm or ranch land, policies and practices should protect soil health, especially during construction and decommissioning.

#### Grow agrivoltaics for agricultural production and solar energy

Agrivoltaics sustain agricultural production under/between the solar panels.

#### Promote equity and farm viability

Farmers and underserved communities

16 Sallet, Lori. "Growing Renewable Energy While Strengthening Farm Viability and Safeguarding Healthy Soil." American Farmland Trust, Sept. 22, 2022. Accessed March 2023.

17 Ibid.

should benefit from solar development and should be included in stakeholder engagement processes.

This type of siting guidance offers a more nuanced approach to clean energy development. By taking a wider array of factors into consideration, including economic impacts and dual usage, this approach demonstrates that clean energy siting does not require an either/or mindset.

Through thoughtful planning, local decision makers can craft policies that respect the property rights of local landowners and allow them to take advantage of opportunities to diversify their income, while at the same time encouraging dual-use practices that preserve the agricultural values of the local community.

### TYPES OF DUAL-USE

There are several types of dual-use practices that can be combined with solar energy sites including cultivating different types of crops such as vegetables and berries, utilizing livestock grazing for managing vegetation, beekeeping, and planting native vegetation and pollinator habitat. These practices can create environmental and economic benefits such as new revenue streams for local farmers, increased pollinators, wildlife habitat, enhanced soil health, reduced erosion, and carbon storage. These projects are not mutually exclusive, however, and multiple activities can occur simultaneously, or at different times of the year.<sup>18</sup>

#### Crops

A variety of agricultural crops can be grown in co-location with solar installations, including fruit, vegetables, and berries. Any crops that are



successful in a region are likely to be suitable for co-location with solar projects. Crops can be grown under the panels, between rows, or outside the perimeter of the installation. Panel height, spacing, water access, equipment needs, and whether the system is fixed or tracking, all will play a role in the success of integrating specific types of crop production into a solar installation. Research is ongoing to better understand the performance and feasibility of co-locating crops with solar energy systems.<sup>19,20</sup>

Iowa State University recently announced it will kick off a \$1.8 million, four-year research project on dual-use and food crop production.<sup>21</sup> Similar food crop-focused research is ongoing through the Sustainably Colocating Agricultural and Photovoltaic Electricity Systems (SCAPES) projects at University of Illinois Urbana-Champaign, University of Arizona, Colorado State University, Auburn University, and

9 "Minnesota Solar and Agriculture." Clean Grid Alliance. Accessed March 2023.

10 Whiskeyman, Danny. "Scott County Board of Supervisors approves new solar ordinance." KWQC, Sept. 20, 2022. Accessed March 2023.

11 Klotzbach, John. "County Considering Wind Turbine Ordinance Changes." Independence Bulletin Journal, Sept. 6, 2022. Accessed March 2023.

12 "Senate Study Bill 1077." Iowa Legislature, Jan. 24, 2023. Accessed March 2023.

13 "Senate File 2127." Iowa Legislature, Jan. 26, 2022. Accessed March 2023.

14 "Senate File 2321." Iowa Legislature, Feb. 17, 2022. Accessed March 2023.

15 "Minnesota Administrative Rules." Minnesota Legislature, Sept. 18, 2009. Accessed March 2023.





University of Chicago.<sup>22</sup>

Outside of food crops, researchers are also looking into whether more traditional row crops can be co-located with solar installations. For example, Purdue University is conducting field trials combining traditional crops like corn and soy with raised solar panels.<sup>23</sup>

#### Grazing

Solar grazing is the utilization of livestock, usually sheep, to manage vegetation at solar sites. It takes the place of traditional mowing and offers both environmental and financial benefits. For project developers, contracting with local farmers to use solar grazing as a management tool can reduce operations and maintenance costs. Solar grazing can offer local livestock owners additional pasture opportunities and the opportunity to be paid for a valuable service, increasing income to their business and adding to the economy of the rural communities where these projects are usually located.<sup>24</sup>



22. Harwood, Lori. "Arizona Partners on \$10M USDA Grant to Expand Research on Growing Crops Under Solar Panels." University of Arizona, Oct. 6, 2021. Accessed March 2023.

23. Bowman, Sarah, et al. "Can solar panels and row crops coexist on farmland across the skeptical Corn Belt?" *Indy Star*, Sept. 13, 2022. Accessed March 2023.

24. "Fact Sheet: Making the Case for Solar Grazing." Center for Rural Affairs, Dec. 20, 2021. Accessed March 2023.



#### Beekeeping

Solar beekeeping is the practice of placing beehives on or near solar sites that have been planted in native vegetation or other pollinator habitats. Solar beekeeping can offer new revenue streams for local beekeepers, as well as the opportunity to gain resiliency from a diverse source of pollen for honey production.

Additionally, the landowner sees a positive impact from improved soil health, and nearby farmers profit from pollination services.<sup>25</sup> Pollinators are critical to crop production, with the USDA estimating that wild and managed bees together add \$15 billion in crop value each year.<sup>26</sup> An Argonne National Laboratory case study found that the value of pollinator habitat on U.S. lands designated as proposed or potential solar sites is between \$1.5 billion and \$3.2 billion.<sup>27</sup>

#### Native Vegetation and Pollinator-Friendly Solar

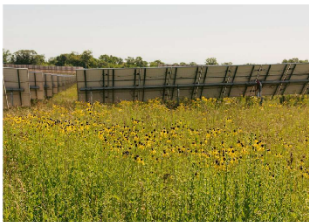
Sites with native or naturalized, non-invasive, flowering vegetation are commonly referred to as "pollinator-friendly solar sites." Pollinator-

25. "Fact Sheet: Making the Case for Solar Beekeeping." Center for Rural Affairs, Dec. 22, 2022. Accessed March 2023.

26. Marieb, Dugan. "Dual-use Solar in the Pacific Northwest: A Way Forward." *Renewable Northwest*, 2019. Accessed March 2023.

27. "Case Study: Economics of Pollinator Habitats at Solar Facilities." Argonne National Laboratory. Accessed March 2023.

friendly solar project sites offer habitat for honey bees, native bees, and other species of pollinators, all of which can positively benefit local agricultural production. Using native or pollinator-friendly vegetation provides numerous benefits, including reduced erosion, improved water quality and soil health, and increased habitat for wildlife. It can also reduce long-term operation and maintenance costs for project developers and site managers.<sup>28</sup>



Determining the appropriate types of dual-use projects most likely to be successful at a specific site can be daunting. However, research is ongoing to understand the components needed for successful deployment and operation of agrisolar projects. From 2015 to 2021, the Innovative Solar Practices Integrated with Rural Economies and Ecosystems (InSPIRE) project studied field research sites and identified five key elements that enable success. These elements were explored in the report "The 5 C's of Agrivoltaic Success Factors in the United States: Lessons from the InSPIRE Research Study." They include:<sup>29</sup>

#### Climate, soil, and environmental conditions

The ambient conditions and factors of

28. Smith, Cody. "Amplifying Clean Energy with Conservation Part One: Pollinator-Friendly Solar." Center for Rural Affairs, October 2020. Accessed March 2023.

29. Macknick, Jordan, et al. "The 5 C's of Agrivoltaic Success Factors in the United States: Lessons from the InSPIRE Research Study." National Renewable Energy Laboratory, 2022. Accessed March 2023.

the specific location that are beyond the control of the solar owners, solar operators, agrivoltaic practitioners, and researchers.

#### Configurations, solar technologies, and designs

The choice of solar technology, the site layout, and other infrastructure that can affect light availability and solar generation.

#### Crop selection and cultivation methods, seed and vegetation designs, and management approaches

The methods, vegetation, and agricultural approaches used for agrivoltaic activities and research.

#### Compatibility and flexibility

The compatibility of the solar technology design and configuration with the competing needs of the solar owners, solar operators, agricultural practitioners, and researchers.

#### Collaboration and partnerships

Understandings and agreements made across stakeholders and sectors to support agrivoltaic installations and research, including community engagement, permitting, and legal agreements.

### POLICY APPROACHES TO DUAL-USE

Policies at the federal, state, and local levels of government can influence the implementation of dual-use solar. These policies interact, but overall, local land-use policies have been shown to be the most significant catalyst or inhibitor of agrisolar development.<sup>30</sup>

We will be looking at a variety of policy approaches at each level of government, including tax incentives, land use laws, renewable portfolio standards, and others.

30. Pascaris, Alexis S. "Examining existing policy to inform a comprehensive legal framework for agrivoltaics in the U.S." *Energy Policy*, December 2021. Accessed March 2023.

### Policy Approaches for Dual-use and AgriSolar Practices

#### Federal

Because land use decisions are typically made at the local level, the role of federal policy in encouraging or discouraging dual-use applications is limited. However, two primary incentives exist for solar development—the Business Energy Investment Tax Credit (ITC) and USDA's Rural Energy for America Program (REAP). Additionally, federal investments in dual-use can help bolster the practice.

#### Tax incentives

The ITC is the sole corporate tax credit available for solar. The tax credit does not include any restrictions that would disallow solar on specific locations, making it acceptable for combination with dual-use.<sup>31</sup>

#### Land-use laws

Authority over land use in the U.S. is held by state and local governments.<sup>32</sup>

#### Portfolio standards

Renewable portfolio standards are policies that require electricity suppliers to provide customers with a stated amount of electricity from renewable sources. Although the idea of a federal renewable portfolio standard has been proposed, no such policy currently exists.<sup>33</sup>

#### Other

REAP grants and loan guarantees offer financial assistance to agricultural producers and small businesses for energy improvements or investments. This can include construction of solar energy systems and does not present conflicts with dual-use integration.<sup>34</sup>

In 2022, DOE announced an \$8 million investment in agrivoltaic research projects. The



Foundational Agrivoltaic Research for Megawatt Scale-funding program is aimed at developing best practices, seeking replicable models, providing new economic opportunities, and reducing land-use conflicts.<sup>35</sup> In 2022, USDA's Partnerships for Climate Smart Commodities awarded the University of Arizona \$4.7 million<sup>36</sup> and the University of Texas Rio Grande Valley \$2.2 million<sup>37</sup> for agrivoltaic research projects.

#### State

State policy approaches to dual-use include tax and other financial incentives, state-level land-use laws, renewable portfolio standards, and pollinator scorecards. State-level policies interact with local decision making in ways that can either enable or restrict local governments from enacting certain practices or policies.

#### Tax incentives

States can incentivize solar dual-use practices through land use taxes. If landowners are able to integrate solar development into their farming operation without a land-use tax change, they may be more receptive to the development. For example, Rhode Island has amended its Farm,

35. "DOE Announces \$8 Million to Integrate Solar Energy Production with Farming." U.S. Department of Energy, Dec. 8, 2022. Accessed March 2023.

36. "Media Advisory: USDA awards over \$4.7M to support and promote 'climate-smart' food production." University of Arizona, Dec. 19, 2022. Accessed March 2023.

37. Gonzalez, Maria. "UTRGV receives \$2.2M grant for 'Climate-Smart' Commodities project." University of Texas Rio Grande Valley, Dec. 12, 2022. Accessed March 2023.

### Policy Approaches for Dual-use and AgriSolar Practices

Forest, and Open Space Land law to exempt landowners from a land-use change tax if they are integrating a dual-use renewable energy generation system, which is defined as a wind or solar system that allows agricultural practices to continue around it under normal practices.<sup>38</sup>



Similarly, in 2021, New Jersey enacted a Dual-Use Solar Law, which provides an incentive for keeping land at solar sites in agricultural production. The law established a pilot program allowing unpreserved farmland used for dual-use solar projects to be eligible for farmland assessment under certain conditions.<sup>39</sup>

The AgriSolar Clearinghouse maintains an interactive map detailing dual-use financial

incentives throughout the United States, including potential funding sources, assistance programs, utility incentives, and tax breaks. It can be found at: [agrisolarclearinghouse.org/financial-information-map](https://agrisolarclearinghouse.org/financial-information-map).

#### Land-use laws

State-level land use laws can significantly impact where solar development can happen. For example, Illinois' Agricultural Areas Conservation & Protection Act creates land areas where only agricultural production is allowed.<sup>41</sup>

As dual-use has evolved, debates about whether implementation of these practices at solar sites should qualify as agricultural land use are ongoing. One practice states can employ to help facilitate dual-use at solar sites is to review land use planning goals and definitions of solar generation, farmland, and farm uses to ensure they do not preclude dual-use solar.<sup>42</sup>

Some states have created statewide siting standards to regulate clean energy development. For example, in early 2023, lawmakers in Illinois passed House Bill 4412, which dictates statewide setbacks for wind and solar development.<sup>43</sup> Alternative approaches, such as the creation of state-specific best practices, model ordinances, or voluntary siting matrices offer ways to preserve local control while also providing helpful guidelines for local decision makers.<sup>44</sup>

41. Guarino, Jessica, and Tyler Swanson. "The Illinois Agrivoltaics Regulatory and Policy Guide Analyzes State and Local Laws." AgriSolar Clearinghouse, Feb. 1, 2023. Accessed March 2023.

42. Marieb, Dugan. "Dual-use Solar in the Pacific Northwest: A Way Forward." *Renewable Northwest*, 2019. Accessed March 2023.

43. Moore, Brenden. "New Illinois state energy project standards welcomed by some, resisted by others." *The Pantagraph*, February 11, 2023. Accessed March 2023.

44. Marieb, Dugan. "Dual-use Solar in the Pacific Northwest: A Way Forward." *Renewable Northwest*, 2019. Accessed March 2023.

45. Mow, Lindsay. "Exploring Siting Guidance: Agriculture Siting Matrices Inform Renewable Energy Siting." Center for Rural Affairs, July 2022. Accessed March 2023.



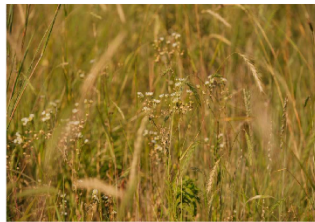
**Portfolio standards**

As of 2021, 31 states and the District of Columbia had adopted renewable portfolio standards or clean energy goals.<sup>46</sup> Within these standards, “carve out” provisions can be used to encourage the adoption of certain technologies, such as solar and dual-use. As of 2021, 21 states had solar carve-out provisions in their renewable portfolio standards. Massachusetts’ SMART program is one example of such a renewable portfolio standard that also incorporates incentives for dual-use.<sup>47</sup>

**Other**

Under the Massachusetts Department of Energy’s Solar Massachusetts Renewable Target (SMART) program, specific kinds of dual-use solar systems, known as Agricultural Solar Tariff Generation Units (ASTGU), can qualify for financial incentives. To qualify, the land under the solar system must be in continuous agricultural production. The SMART program offers a base cents-per-kilowatt-hour compensation rate for new solar arrays. Systems using these practices that qualify as an ASTGU receive an additional 6 cents per kilowatt-hour to the base rate.<sup>48 49 50</sup>

Many states across the U.S. have created policies or programs to encourage or require implementation of pollinator habitat at solar



sites. These initiatives can vary widely in their structure and implementation. One tool is a pollinator scorecard, which provides a model to score pollinator-friendly practices. This score can be used to gauge if a site meets state or local requirements, to designate a site as pollinator-friendly, or to determine if a site qualifies for other types of incentives.<sup>51</sup>

For example, Minnesota state code (§216B.1642)<sup>52</sup> authorizes the Board of Soil and Water Resources to establish statewide guidance for solar project developers aiming for recognition under the Habitat Friendly Solar Program. The statute reads, “...an owner of a solar site implementing solar site management practices may claim that the site provides benefits to gamebirds, songbirds, and pollinators only if the site adheres to guidance set forth by the pollinator plan provided by the Board of Water and Soil Resources.”<sup>53 54</sup>

**Local**

Local land-use policy is the key leverage point

- 51 “Pollinator-Friendly Solar Scorecards,” Fresh Energy. Accessed March 2023.  
 52 “2019 Minnesota Statutes,” Office of the Revisor of Statutes, Minnesota Legislature. Accessed March 2023.  
 53 “Minnesota Habitat-Friendly Solar Program,” Minnesota Board of Water and Soil Resources, 2019. Accessed March 2023.  
 54 Smith, Cody. “Amplifying Clean Energy with Conservation, Part One: Pollinator-Friendly Solar,” October 2020. Accessed March 2023.



for enabling development on land suitable for combining agriculture and solar energy production.<sup>55</sup> This is because local governments usually have the most influence over land use, including the ability to regulate zoning and develop siting ordinances that dictate how and where development can occur. Tax incentives and renewable portfolio standards are seen more in state-level policy.

**Tax incentives**

Local governments have the ability to create tax incentives, though these are more common in state-level policy.

**Land-use laws**

Land-use laws are the primary lever for local governments to facilitate dual-use. However, despite rapid expansion of solar energy development, many local governments have not addressed siting in their ordinances. In a review of local-level policies in Illinois, researchers found that many counties had no solar siting

- 55 Pascaris, Alexis S. “Examining existing policy to inform a comprehensive legal framework for agrivoltaics in the U.S.” Energy Policy, December 2021. Accessed March 2023.

ordinance on the books, and the counties that did represented drastically different approaches to zoning and land-use policy.<sup>56</sup> As of 2020, only 19% of zoning ordinances in Michigan addressed utility-scale solar siting.<sup>57</sup> When counties lack an ordinance, it can create uncertainty for decision makers and developers, who won’t know if the land use is permitted or prohibited.<sup>58</sup>

Solar siting often depends on the county’s comprehensive land-use plans and resulting zoning and siting ordinances. When developing ordinances, local decision makers often use the county’s land-use planning goals to help guide the process. For example, in Buchanan County, Iowa, county supervisors cited language in their comprehensive land-use plan about preserving agricultural lands with highly productive soils to propose a restriction on clean energy development on lands with high CSR.<sup>59</sup> Expressing similar concern, Scott County, Iowa passed an ordinance restricting solar development on lands with high CSR.<sup>60 61</sup>

Conversely, some counties have identified renewable energy development as a priority within their comprehensive land-use plan. Linn County, Iowa’s comprehensive plan contains a section on renewable energy, which identifies an objective to “encourage development of local alternative and renewable energy resources through identification and removal of regulatory

- 56 Guarino, Jessica, and Tyler Swanson. “The Illinois Agrivoltaics Regulatory and Policy Guide Analyzes State and Local Laws.” AgriSolar Clearinghouse, Feb. 1, 2023. Accessed March 2023.  
 57 Pascaris, Alexis S. “Examining existing policy to inform a comprehensive legal framework for agrivoltaics in the U.S.” Energy Policy, December 2021. Accessed March 2023.  
 58 Ibid.  
 59 Klotzbach, John. “County Considering Wind Turbine Ordinance Changes.” Independence Bulletin Journal, Sept. 6, 2022. Accessed March 2023.  
 60 “Scott County Ordinance No. 22-04.” Scott County, Iowa, Sept. 15, 2022. Accessed March 2023.  
 61 Whiskeyman, Danny. “Scott County Board of Supervisors approves new solar ordinance.” KWOC, Sept. 20, 2022. Accessed March 2023.



barriers.”<sup>62</sup>

Additionally, local governments can adopt siting ordinances that dictate specific dual-use management practices at solar sites. For example, ordinances can require sites to be planted in native vegetation or pollinator habitat, or to be maintained by livestock grazing.

**Portfolio standards**

Both municipalities and utilities have the ability to set their own renewable electricity goals.

**Other**

Community agrisolar projects can improve local buy-in by providing an opportunity for community members to become shareholders.<sup>63</sup>

**CONSIDERATIONS FOR LOCAL DECISION MAKERS: HOW ORDINANCES CAN FACILITATE DUAL-USE**

Decision makers who want to facilitate the combination of clean energy development and agriculture should consider the following topics when engaging in the ordinance development or amendment process:

**Land-use Planning**

Comprehensive land-use plans are commonly used by counties to help guide development. These plans reflect the values and vision of the community and, in rural areas, they often contain language relating to the preservation of agricultural heritage and farmland. The way this language is interpreted varies widely between counties, and some decision makers may have difficulty interpreting how language around agricultural resource protection relates to dual-use.<sup>64</sup>

Implementation of dual-use practices can provide an alternative to an either/or mindset relating to agriculture and clean energy development, as they allow land to stay in agricultural use. Combining livestock grazing, crop production, and other endeavors with solar sites preserves the agricultural roots of rural communities while also allowing landowners and counties to take advantage of the environmental and economic benefits of clean energy development.

Including renewable-energy development within the county’s comprehensive plan can ensure the economic benefits of this development are taken into consideration when ordinances are created or amended in the future. Clean energy can benefit counties in the form of increased tax revenues, lease payments to local landowners, and job creation. Combining this development with dual-use can offer increased environmental benefits and provide new revenue streams for local farmers.

**Zoning and Siting Regulations**

Local decision makers can ensure that development is done in a way that meets the needs of the community by engaging in a proactive ordinance development process. By taking the time to create an ordinance before development has been proposed, decision makers can ensure there is time to receive

- 64 Marieb, Dugan. “Dual-use Solar in the Pacific Northwest: A Way Forward.” Renewable Northwest, 2019. Accessed March 2023.

community input and feedback on proposed language. Additionally, considerations can be made about setting additional land use expectations, such as dual use.

Counties wanting to enable dual-use integration should consider zoning schemes that allow for mixed land usage. This could include overlay districts, which would allow a special permit for solar in certain zones, or allowing development when certain land use standards are met, such as placing a certain percentage of land into pollinator habitat.<sup>65</sup>

Siting regulations should be carefully crafted to ensure they don’t restrict dual-use. For example, setting restrictions on panel height or developing overly prescriptive vegetation management requirements can limit dual-use opportunities.

**Definitions**

When creating definitions within zoning and siting regulations, local governments can ensure they do not preclude dual-use solar. This could include refining definitions for solar generation, farmland, and farm uses to ensure compatibility with desired dual-use practices.<sup>66</sup>

It is also important to determine which applications and practices will be considered dual-use. For example, in Oregon, a rule was adopted allowing for dual-use practices on high-value soils. However, the rule only specifies agrivoltaics and grazing, meaning pollinator habitats or other conservation dual-use do not qualify.<sup>67</sup>

**Interaction of Dual-use Goals**

When creating policies, it is especially important to carefully consider how the dual-usage

- 65 Pascaris, Alexis S. “Examining existing policy to inform a comprehensive legal framework for agrivoltaics in the U.S.” Energy Policy, December 2021. Accessed March 2023.  
 66 Marieb, Dugan. “Dual-use Solar in the Pacific Northwest: A Way Forward.” Renewable Northwest, 2019. Accessed March 2023.  
 67 Ibid.

goals interact. Certain requirements may unintentionally restrict beneficial practices. For example, native vegetation or pollinator-friendly habitat requirements may unintentionally limit grazing opportunities if plants on the site are not suitable. In the same vein, to meet pollinator requirements vegetation must be allowed to bloom to ensure it is actually benefiting pollinators, requiring grazing schedules be modified to accommodate bloom times.<sup>68</sup>



It is wise to consider that 100% of land may not be able to be integrated into dual-use. Setting overly strict guidance could deter development if prescriptions are not feasible. Instead, requiring a percentage of land to be used for dual-use purposes introduces a level of flexibility while ensuring that the original intent of the usage policy is preserved.

**Site Construction, Decommissioning, and Restoration**

Although not directly related to dual-use, local governments can use ordinances to minimize land impacts during the construction and decommissioning of solar systems.

Solar projects generally have minimal impact on land quality, and land can be returned to farming at the end of the project’s life cycle, if desired. However, being clear about how land will be

- 68 “Fact Sheet: Making the Case for Solar Grazing.” Center for Rural Affairs, Dec. 20, 2021. Accessed March 2023.

managed during construction as well as once a project is decommissioned can help protect land quality. Local governments can set requirements for construction, vegetation management, and decommissioning that spell out the expectations and obligations. This can also include requiring financial guarantees to ensure funds are available for decommissioning purposes and that local governments are not responsible for costs.<sup>69</sup>

### KEY TAKE-AWAYS

Solar development is expected to rise significantly in the coming years. Although deployment models reflect that will require a large amount of land, it is expected it will require 0.5% of land in the contiguous U.S. and, in many cases, can be placed on already disturbed or marginal lands. Even if all proposed projects in Minnesota and Iowa were sited on prime farmland, it would only represent 1.32% and 0.11% of all prime land in those states, respectively.

Clean energy and agriculture do not require an either/or approach. Through thoughtful planning, local decision makers can craft policies that respect the property rights of local landowners and allow them to take advantage of opportunities to diversify their income, while at the same time encouraging dual-use and agrisolar practices that preserve the agricultural values of the local community.

Dual-use and agrisolar practices can include cultivating crops, utilizing livestock grazing, beekeeping, and planting native vegetation and pollinator habitat. These practices can create a variety of environmental and economic benefits, such as new revenue streams for local farmers, increased



pollinators, wildlife habitat, and soil health, reduced erosion, and carbon storage.

Policies exist at the federal, state, and local levels of government that can influence the implementation of dual-use solar and agrivoltaics. These policies interact but overall, local land-use policies have the most significant role in impacting solar and agrivoltaic development.

By engaging in a proactive ordinance development process, local decision makers can ensure that development is done in a way that meets the needs of their community. Creating an ordinance in advance of development ensures there is time to receive community input and feedback on the proposed language.

<sup>69</sup> Kolbeck-Urlacher, Heidi. "Decommissioning Solar Energy Systems Resource Guide." Center for Rural Affairs, June 2022. Accessed March 2023.

ORDINANCE NO. \_\_\_\_\_

WOODBURY COUNTY, IOWA

AN ORDINANCE AMENDING THE TEXT OF THE WOODBURY COUNTY ZONING ORDINANCE TO AMEND PORTIONS OF: THE *TABLE OF CONTENTS*; SECTION 3.03.4 ENTITLED: *LAND USE SUMMARY TABLE OF ALLOWED USES IN EACH ZONING DISTRICT*; PORTIONS OF: *SECTION 6.02 ENTITLED DEFINITIONS*; AND THE RENUMBERING OF DEFINITIONS AND PAGE NUMBERS.

NOW, THEREFORE, BE IT ENACTED BY THE BOARD OF SUPERVISORS OF WOODBURY COUNTY, IOWA THAT THE BELOW ZONING ORDINANCE LANGUAGE AMENDMENTS BE MADE:

**Amendment #1 –**

On page 39: To add the following line item use language within zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the “Utilities” category:

“Solar Energy Systems (Private use)”. With placement of the letter “A” within the AP (Agricultural Preservation), AE (Agricultural Estates), NR (Non-Agricultural Residential Zoning District), SR (Suburban Residential), GC (General Commercial), HC (Highway Commercial), LI (Limited Industrial), and GI (General Industrial) zoning districts columns on the table related to this line item use.

On page 92: To add the following definition, “Solar Array” as definition 158 to Article 6. Definitions. Section 6.02: Definitions as “158. Solar Array. Equipment used for private or utility scale solar energy systems. Can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure.”

On page 92: To add the following definition, “Solar Energy Systems, Private” as definition 159 to Article 6. Definitions. Section 6.02: Definitions as “159. Solar Energy Systems, Private. An energy system that converts solar energy to usable thermal, mechanical, chemical, or electrical energy primarily for immediate onsite use that already has an existing principal use on the same parcel. Solar Energy Systems, Private shall be allowed only as a non-utility scale accessory use to a permitted principal use. Surplus energy sold back to a utility must comply with all applicable laws including but not limited to Section 199, Chapter 15.11(5) of *Iowa Administrative Code*, and all requirements of the Iowa Utilities Board. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure.”

**Amendment #2 –**

On page 39: To add the following line item use language within zoning ordinance Section 3.03.4 *Land Use Summary Table of Allowed Uses in each Zoning District* under the “Utilities” category:

“Solar Energy Systems, Utility Scale”. With placement of the letter “C” within the AP (Agricultural Preservation) and the GI (General Industrial) zoning districts columns on the table related to this line item use and with the placement of “--” in the AE (Agricultural Estates), NR (Non-Agricultural Residential Zoning District), SR (Suburban Residential), GC (General Commercial), HC (Highway Commercial), and LI (Limited Industrial) zoning districts columns on the table related to this line item use.

On page 92: To add the following definition of “Solar Energy Systems, Utility Scale” as definition 160 to Article 6. Definitions. Section 6.02: Definitions as “160. Solar Energy Systems, Utility Scale. An energy system, commonly referred to as a “solar farm”, which converts solar energy to useable thermal, mechanical, chemical, or electrical energy primarily for transmission through the electrical grid for offsite use or wholesale and/or retail sale. Systems can be mounted on primary or accessory structures, on a racking system affixed to the ground, or integrated as a mechanical or structural component of a structure. Utility scale solar energy systems do not include concentrating solar power (CSP) systems.”



**Amendment #3 –**

Beginning on page 92, to re-designate or re-number the definitions in Article 6. Definitions. Section 6.02: Definitions 158 through 188. The purpose is to add “Solar Array” as definition 158, “Solar Energy Systems, Private” as Definition 159, and “Solar Energy Systems, Utility Scale” as Definition 160 thereby pushing the existing definitions 158 through 188 ahead three positions with Article 6. Definitions. Section 6.02 now including definitions 1 through 191.

Beginning on page 82, to amend Article 6. Definitions by moving the start page from page 82 to page 83.

On page iii: To repeal and replace “Section 6.01: Construction of Terms ..... 82” with “Section 6.01 Construction of Terms ..... 83”

On page iii: To repeal and replace “Section 6.02: Definitions ..... 82” with “Section 6.01: Definitions ..... 83”

Adopted this \_\_\_\_ day of \_\_\_\_, 2023

**THE WOODBURY COUNTY BOARD OF SUPERVISORS**

\_\_\_\_\_  
Matthew Ung, Chairman

\_\_\_\_\_  
Jeremy Taylor, Vice-Chairman

\_\_\_\_\_  
Daniel Bittinger II

Attest:

\_\_\_\_\_  
Mark Nelson

\_\_\_\_\_  
Patrick Gill, Woodbury County Auditor

\_\_\_\_\_  
Keith Radig

Adoption Timeline:

Date of Public Hearing and First Reading \_\_\_\_\_

Date of Public Hearing and Second Reading \_\_\_\_\_

Date of Public Hearing and Third Reading \_\_\_\_\_

Date of Adoption \_\_\_\_\_

Published/Effective Date \_\_\_\_\_