

CASE NO. 895-AT-18

SUPPLEMENTAL MEMORANDUM #7

April 5, 2018

Petitioner: Zoning Administrator

Request: Amend the Champaign County Zoning Ordinance to add “Solar Farm” as a new principal use under the category “Industrial Uses: Electric Power Generating Facilities” and indicate that Solar Farm may be authorized by a County Board Special Use Permit in the AG-1 Zoning District and the AG-2 Zoning District; add requirements and fees for “Solar Farm”; add any required definitions; and make certain other revisions are made to the Ordinance as detailed in the full legal description in Attachment A.

Location: Unincorporated Champaign County

Time Schedule for Development: As soon as possible

Prepared by: **Susan Burgstrom**
Senior Planner

John Hall
Zoning Administrator

Brookens Administrative Center
1776 E. Washington Street
Urbana, Illinois 61802

(217) 384-3708

zoningdept@co.champaign.il.us

www.co.champaign.il.us/zoning

STATUS

At the March 29, 2018 ZBA meeting, the Board voted to hold a special meeting on April 5, 2018. Please see the “Testimony from March 29, 2018 ZBA Meeting” section below for a summary of public comments.

Additional consideration is being given to separation distances between a solar farm and adjacent residences due to noise and viewshed concerns. See the “Separation Distance from Residential Properties” section below.

P&Z Staff have received the following communications since the March 29, 2018 hearing:

- On April 2, 2018, P&Z Staff received an email from Patrick Brown, BayWa-r.e. Solar Projects LLC, with an attachment regarding sound measurements for an inverter model from SMA Solar Technology. See Attachment B for the email and the attached study.
- On April 2, 2018, P&Z Staff received an email from Ted Hartke in which he suggests that renewable energy is more costly for taxpayers and ratepayers. See Attachment C for the email and an article he included to support his opinion.
- On April 3, 2018, P&Z Staff received an email from Jason Arrasmith, a Sidney Village Trustee. He highlights residents’ concerns heard at the Village of Sidney regular board meeting on April 2, 2018. See Attachment D for his email.
- On April 3, 2018, P&Z Staff received an email from Valerie Hopkins Bernard, a resident of Philo. She is opposed to the allowing solar and wind farms in Champaign County. She asks that if they are allowed, that responsible regulations protecting residents and wildlife be approved. See Attachment E for her email.

- On April 3, 2018, P&Z Staff received a phone call from Lezli Cline, Sidney resident. She expressed her opposition to any solar farm that seeks to develop on productive agricultural land. She is specifically against the location of the proposed 1,200 acre solar farm near Sidney that is 60 times the size of the U of I solar farm. She does not think it belongs anywhere near residences, and the proposed setback of 50 feet to a residential property line/100 feet to a residence is insufficient. She feels that property values will decrease, and that the case has been somewhat “back-doored in” and she hopes she is not too late to be heard in time for a decision on this solar farm.
- On April 5, 2018, the County Star printed an article by Christine Walsh, *County ZBA to meet about solar farm on Thursday*. See Attachment G.
- On April 5, 2018, P&Z Staff received an email from Jonathon Manuel, Resource Conservationist with the Champaign County Soil and Water Conservation District regarding pollinator friendly grass seed mix. See Attachment H.
- Susan Burgstrom requested any known studies regarding solar farm impacts on soil from Morgan White, University of Illinois Sustainability Coordinator. Mrs. White requested a response from Professor Scott Willenbrock, Professor of Physics and Provost Fellow for Sustainability at the University of Illinois at Urbana-Champaign. On April 5, 2018, Professor Willenbrock sent a study created for Cypress Creek Renewables by Tim O’Connor, Ecobiologist with Fields of Green, titled “Illinois Soil Conservation and Revitalization Using Native Vegetation” – see Attachment I.
- On April 5, 2018, Susan Burgstrom took several photos of the University of Illinois Solar Farm in order to illustrate distance from solar farm equipment. See Attachment J.

TESTIMONY FROM MARCH 29, 2018 ZBA MEETING

The following is a summary of testimony from the March 29th meeting, which will be added as evidence under Item 16.E.(4) of the Findings of Fact:

- (4) At the March 29, 2018 public hearing for this case, the following testimony was received:
 - a. Cindy Shepherd, Central Illinois Outreach Director for Faith in Place, provided a handout of her presentation. She said that her organization supports the Future Energy Jobs Act and the opportunities it creates for solar energy. She said that Faith in Action believes that one way to support our neighbors who are economically challenged is lowering energy costs and providing good jobs, and the clean energy sector is poised to do that in Illinois. She said that community solar projects can be especially beneficial to those who would like to reduce their energy costs.
 - b. Colleen Ruhter, 910 CR 2200E, Sidney, wants to preserve the rural character that they sought when buying their 5 acre farm a few years ago. She is also concerned about the environmental impact of the fencing around solar farms, wildlife habitats, and ecosystems. She wants weeds on the solar farms to be maintained, and she is in favor of pollinator plants under the solar panels. She believes that a noise study should be required for solar farm developments.

- c. Scott Willenbrock, 1017 West White Street, Champaign, testified that he is in favor of solar energy.
- d. Ted Hartke, 1183 CR 2300E, Sidney, testified that the currently proposed separation between solar equipment and properties of 3 acres or less should be expanded to include all residential properties, not just the smaller ones. He would like to see a separation greater than 100 feet. He thinks that solar farm developments should be required to produce less noise than what the proposed amendment stipulates. He said that solar energy is not needed, there is plenty of energy already produced in other forms, and that solar would steal from landowners' enjoyment of their land and surroundings.
- e. Tim Osterbur, 302 Witt Park Road, Sidney, requested that setbacks from solar farms be adequate for residential neighbors.
- f. Jeff Justus, 2155 CR 900N, Sidney, testified that drainage tiles need to be maintained, and asked how the solar companies might get a big backhoe in to repair tile when there are solar panels in the way.
- g. Patrick Brown, BayWa-r.e. Solar Projects LLC, stated that his company appreciates the work that has been done on the proposed amendment, and said they still have 3 areas of concern: having the ordinance allow Letters of Credit rather than an escrow account; making sure the fees cover the costs of processing the Special Use Permit application yet are reasonable for solar developers; and using logic and discretion to determine the extent of required screening. He is concerned that solar companies will not want to develop in Champaign County if the ordinance is too cumbersome.
- h. Tim Montague, 2001 Park Ridge Drive, Urbana, testified that land will become more productive when left fallow. He said it is not in the solar developer's interest to have broken drainage tile, and emphasized that utility scale solar would be a tourist attraction that would benefit Champaign County.
- i. Anne Parkinson, 1604C Lyndhurst, Savoy, testified in favor of solar energy.
- j. Ray Griest, 1802 Cindy Lynn, Urbana, asked that Drainage District tiles be checked in proposed project areas, and recommends against constructing anything in Drainage District easements.
- k. Daniel Herriott, 30 Dunlap, Sidney, asked the Board to consider lifelong residents in areas that might have solar farms. He asked them to consider what the area would look like in 25 years, which is the estimated life expectancy of solar panels, and what it would look like in 39 years, which is right before the typical 40 year solar farm lease would expire.

SEPARATION DISTANCE FROM RESIDENTIAL PROPERTIES

Based on public concerns and input from comparable counties, P&Z Staff have further evaluated how much separation should be required between solar farm equipment and residential properties. The separation distance requirement would help alleviate concerns about noise and preserving the rural viewshed.

At the March 29, 2018 ZBA meeting, a Board member asked that the April 5th meeting discussion include using a 500 feet separation distance with the ability to reduce that under the waiver procedure, as opposed to having a minimal standard with the ability to increase it. P&Z Staff recommends establishing a minimum separation subject to request for waiver but that may be increased by the ZBA. No consistent justification has been identified for a specific separation distance.

Attachment F is a comparison of separation distances by land use in the Champaign County Zoning Ordinance. P&Z Staff hope that it can help calibrate the Board’s determination of separation distances for solar farms.

Other Illinois counties with solar farm ordinances have established separation distances from 50 feet to 500 feet from residences that are not part of a Solar Farm Special Use Permit. P&Z Staff reached out to three of the counties which had approved a 500 feet separation distance to see what justification they had for that particular distance. Tazewell County responded that the 500 foot requirement seemed to be the norm in other counties’ ordinances. Knox County responded that they used 500 feet because that is what Tazewell County had adopted. However, with the experience of a recent Solar Farm Special Use Permit case and additional research, they are proposing an amendment this week requesting that the 500 feet setback be reduced to 100 feet. P&Z Staff have requested more information from Knox County as to their justification for this reduction.

DISTINCTION BETWEEN PARTICIPATING AND NON-PARTICIPATING PROPERTIES

The proposed revision for separation distances below makes a distinction between PARTICIPATING and NON-PARTICIPATING PROPERTIES so that those who are not participating can be located farther away from solar farm equipment than participating properties.

Note that the definition of “DWELLING or PRINCIPAL BUILDING, PARTICIPATING” and “DWELLING or PRINCIPAL BUILDING, NON-PARTICIPATING” should be amended as follows:

DWELLING or PRINCIPAL BUILDING, PARTICIPATING: A DWELLING on land that is leased to a WIND FARM or PV SOLAR FARM.

DWELLING or PRINCIPAL BUILDING, NON-PARTICIPATING: A DWELLING on land that is not leased to a WIND FARM or PV SOLAR FARM.

PROPOSED REVISION TO SEPARATION DISTANCE REQUIREMENTS

P&Z Staff offer the following revisions to the separation distance requirements:

- 6.1.5 D. Minimum Standard Conditions for Separations for PV SOLAR FARM from adjacent USES and STRUCTURES

The location of each PV SOLAR FARM shall provide the following required separations as measured from the exterior of the above ground portion of the PV SOLAR FARM STRUCTURES and equipment ~~including fencing except for fencing~~:

1. A SETBACK of 55 feet from a MINOR STREET and a SETBACK of 75 feet from a COLLECTOR STREET and a SETBACK of 85 feet from a MAJOR STREET.
2. For properties participating in the solar farm: No required separation from any existing DWELLING or existing PRINCIPAL BUILDING except as required to ensure that a minimum zoning lot is provided for the existing DWELLING or PRINCIPAL BUILDING.
3. For properties not participating in the solar farm:
 - (a) At least ~~100-250~~ feet from any existing DWELLING or existing PRINCIPAL BUILDING and not less than ~~50-200~~ feet from the property line of any adjacent LOT that is ~~three-five~~ acres or less in area and provided that the noise level caused by the PV SOLAR FARM complies with the applicable Illinois Pollution Control Board regulations. This separation distance applies to properties that are adjacent to or across a STREET from a PV SOLAR FARM.
 - (b) At least ~~100-250~~ feet from any existing DWELLING or existing PRINCIPAL BUILDING and not less than 50 feet from the property line of any adjacent LOT that is ~~three-greater than five~~ acres ~~or less~~ in area and provided that the noise level caused by the PV SOLAR FARM complies with the applicable Illinois Pollution Control Board regulations. This separation distance applies to properties that are adjacent to or across a STREET from a PV SOLAR FARM.
 - (c) Additional setback may be required as deemed necessary by the BOARD.
34. A separation of at least 500 feet from any of the following unless the SPECIAL USE permit application includes results provided from an analysis using the Solar Glare Hazard Analysis Tool (SGHAT) for the Airport Traffic Control Tower cab and final approach paths, consistent with the Interim Policy, Federal Aviation Administration (FAA) Review of Solar Energy Projects on Federally Obligated Airports, or the most recent version adopted by the FAA, and the SGHAT results show no detrimental affect with less than a 500 feet separation from any of the following:
 - (a) any AIRPORT premises or any AIRPORT approach zone within five miles of the end of the AIRPORT runway; or
 - (b) any RESTRICTED LANDING AREA that is NONCONFORMING or which has been authorized by SPECIAL USE permit and that existed on or for which there had been a complete SPECIAL USE permit application

received by April 22, 2010, or any approach zone for any such RESTRICTED LANDING AREA; or

- (c) any RESIDENTIAL AIRPORT that existed on or for which there had been a complete SPECIAL USE permit application received by April 22, 2010, or any approach zone for any such RESIDENTIAL AIRPORT.

45. A separation of at least 500 feet between substations and transmission lines of greater than 34.5Kva to adjacent dwellings and residential DISTRICTS.

6. Separation distances for any PV SOLAR FARM with solar equipment exceeding 8 feet in height, with the exception of transmission lines which may be taller, shall be determined by the BOARD on a case-by-case basis.

PROPOSED REVISION TO FENCING REQUIREMENTS

P&Z Staff offer the following revisions to the fencing requirements based on the proposed revisions to separation distance:

6.1.5 M. Screening and fencing

1. Perimeter fencing:

- (a) PV SOLAR FARM equipment and structures shall be fully enclosed and secured by a fence with a minimum height of 7 feet.
- (b) Knox boxes and keys shall be provided at locked entrances for emergency personnel access.
- (c) ~~The PV SOLAR FARM~~ perimeter fencing shall be ~~a minimum of 10 feet from a SIDE or REAR LOT LINE but not less than 25 feet from the property line of any adjacent LOT that is three acres or less in area and~~ a minimum of 40 feet from a MINOR STREET and a minimum of 55 feet from a COLLECTOR STREET and a minimum of 60 feet from a MAJOR STREET but in no case shall the perimeter fencing be less than 10 feet from the RIGHT OF WAY of any STREET.
- (d) Vegetation between the fencing and the LOT LINE shall be maintained such that NOXIOUS WEEDS are controlled or eradicated consistent with the Illinois Noxious Weed Law (505 ILCS 100/1 et seq.). Management of the vegetation shall be explained in the application.
- (e) Required location of fencing in relation to NON-PARTICIPATING properties:
1. The perimeter fencing shall be a minimum of ~~10-200~~ feet from a SIDE or REAR LOT LINE ~~but not less than 25 feet from the property line~~ of any adjacent LOT that is ~~three-five~~ acres or less in area.

2. The perimeter fencing shall be a minimum of 10 feet from a SIDE or REAR LOT LINE but not less than 250 feet from any existing DWELLING or existing PRINCIPAL BUILDING of any adjacent LOT that is greater than five acres in area.

ATTACHMENTS

- A Legal advertisement
- B Email from Patrick Brown, BayWa-r.e. Solar Projects LLC, received April 2, 2018, with attachment: White Paper BU-U-019: Sunny Central
- C Email from Ted Hartke received April 2, 2018 (includes article – *Green Energy Poverty: Are Low Income Americans Impoverished by Alternative Energy?*)
- D Email from Jason Arrasmith, Village of Sidney Trustee, received April 3, 2018
- E Email from Valerie Hopkins Bernard received April 3, 2018
- F Comparison of separation distances by land use in Champaign County Zoning Ordinance dated April 3, 2018
- G *County ZBA to meet about solar farm on Thursday* by Christine Walsh, the News Gazette County Star, April 5, 2018
- H Email from Jonathon Manuel, Resource Conservationist with the Champaign County Soil and Water Conservation District received April 5, 2018
- I “Illinois Soil Conservation and Revitalization Using Native Vegetation” by Tim O’Connor, provided by Professor Scott Willenbrock, UIUC, received April 5, 2018
- J Photos of the University of Illinois Solar Farm taken by Susan Burgstrom on April 5, 2018

LEGAL PUBLICATION: WEDNESDAY, FEBRUARY 14, 2018

CASE: 895-AT-18

**NOTICE OF PUBLIC HEARING REGARDING A PROPOSED AMENDMENT TO THE
CHAMPAIGN COUNTY ZONING ORDINANCE.**

CASE: 895-AT-18

The Champaign County Zoning Administrator, 1776 East Washington Street, Urbana, has filed a petition to change the text of the Champaign County Zoning Ordinance. The petition is on file in the office of the Champaign County Department of Planning and Zoning, 1776 East Washington Street, Urbana, IL.

A public hearing will be held **Thursday, March 1, 2018, at 6:30 p.m.** prevailing time in the Lyle Shields Meeting Room, Brookens Administrative Center, 1776 East Washington Street, Urbana, IL, at which time and place the Champaign County Zoning Board of Appeals will consider a petition to:

Amend the Champaign County Zoning Ordinance as follows:

Part A. Amend Section 3 by adding definitions including but not limited to “NOXIOUS WEEDS” and “SOLAR FARM”.

Part B. Add paragraph 4.2.1 C.5. to indicate that SOLAR FARM may be authorized by County Board SPECIAL USE permit as a second PRINCIPAL USE on a LOT in the AG-1 DISTRICT or the AG-2 DISTRICT.

Part C. Amend Section 4.3.1 to exempt SOLAR FARM from the height regulations except as height regulations are required as a standard condition in new Section 6.1.5.

Part D. Amend subsection 4.3.4 A. to exempt WIND FARM LOT and SOLAR FARM LOT from the minimum LOT requirements of Section 5.3 and paragraph 4.3.4 B. except as minimum LOT requirements are required as a standard condition in Section 6.1.4 and new Section 6.1.5.

Part E. Amend subsection 4.3.4 H.4. to exempt SOLAR FARM from the Pipeline Impact Radius regulations except as Pipeline Impact Radius regulations are required as a standard condition in new Section 6.1.5.

Part F. Amend Section 5.2 by adding “SOLAR FARM” as a new PRINCIPAL USE under the category “Industrial Uses: Electric Power Generating Facilities” and indicate that SOLAR FARM may be authorized by a County Board SPECIAL USE Permit in the AG-1 Zoning DISTRICT and the AG-2 Zoning DISTRICT and add new footnote 15. to exempt a SOLAR FARM LOT from the minimum LOT requirements of Section 5.3 and paragraph 4.3.4 B. except as minimum LOT requirements are required as a standard condition in new Section 6.1.5.

Part G. Add new paragraph 5.4.3 F. that prohibits the Rural Residential OVERLAY DISTRICT from being established inside a SOLAR FARM County Board SPECIAL USE Permit.

Part H. Amend Subsection 6.1.1 A. as follows:

1. Add SOLAR FARM as a NON-ADAPTABLE STRUCTURE and add references to the new Section 6.1.5 where there are existing references to existing Section 6.1.4.
2. Revise subparagraph 6.1.1 A.11.c. by deleting reference to Section 6.1.1A. and add reference to Section 6.1.1A.2.

Part I. Add new subsection 6.1.5 SOLAR FARM County Board SPECIAL USE Permit with new standard conditions for SOLAR FARM.

Part J. Add new subsection 9.3.1 J. to add application fees for a SOLAR FARM zoning use permit.

Part K. Add new subparagraph 9.3.3 B.8. to add application fees for a SOLAR FARM County Board SPECIAL USE permit.

All persons interested are invited to attend said hearing and be heard. The hearing may be continued and reconvened at a later time.

Catherine Capel, Chair
Champaign County Zoning Board of Appeals

TO BE PUBLISHED: WEDNESDAY, FEBRUARY 14, 2018 ONLY

Send bill and one copy to: Champaign County Planning and Zoning Dept.
Brookens Administrative Center
1776 E. Washington Street
Urbana, IL 61802
Phone: 384-3708

Susan Burgstrom

From: John Hall
Sent: Thursday, March 29, 2018 10:34 PM
To: Susan Burgstrom
Subject: FW: SMA White Paper
Attachments: White Paper BU-U-019 Sound Power Measurements on SC XXXX (-US) V3.0.pdf

From: Patrick Brown [mailto:Patrick.Brown@baywa-re.com]
Sent: Thursday, March 29, 2018 2:41 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: SMA White Paper

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APR 02 2018

CHAMPAIGN CO. F & Z DEPARTMENT

Patrick Brown
Director of Development



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White Paper BU-U-019: Sunny Central

Sound Power Measurements on SC xxxx (-US) central inverters

Performed by:

SMA Solar Technology AG - Sonnenallee 1 - 34266 Niestetal, Germany - EMC Environment Laboratory (EMV- und Umweltlabor)

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APR 02 2018

Summing up of the Situation

CHAMPAIGN CO. P & Z DEPARTMENT

Measurements were taken for one central inverter each of the models SC 2200 and SC 2500-EV. The sound power measurements were performed in accordance with the DIN EN ISO 9614-2:12/1996 standard, "Determination of sound power levels of noise sources using sound intensity".

The measurements were taken under nominal operating conditions for the inverters, with all inverter fans operating at maximum speed.

Inspection Reference According to EN ISO 3744:2011-02

EN ISO 3744 is used as the basis for determining the noise emissions of the unit under test according to EN ISO 12001:05-2007.

As part of the acoustics, it includes the determination of the sound level of noise sources using the enveloping surface method of accuracy class 2 for essentially free field conditions over a reflective plane. Measurements must be carried out in compliance with IEC 551 and DIN EN 45645-1 according to DIN EN ISO 3744. To position the measurement instruments, the enclosure of the unit under test is considered a main radiation area.

Inspection Reference According to EN ISO 9614-2:2010-11

The sound level is determined according to DIN EN ISO 9614-2 "Determination of sound power levels of noise sources using sound intensity", Part 2: "Measurement by scanning".

This measurement procedure keeps interference on the measurement result caused by noises from the environment to a minimum.

Type of Test / Thresholds and Requirements:

Type of Test / Thresholds and Requirements:	Sound level measurement according to DIN EN ISO 3744:2011-02 and DIN EN ISO 9614-2:2010-11 of sinusoidal, irregularly shaped, transient signals. Classification of ambient conditions in compliance with the German Noise Control Guidelines (TA Lärm). (according to Section 2)
Result:	The requirements were fulfilled.



Result of Measurements

The following rating levels can be determined from the sound power measurements performed:

Inverter type	Sound power level mean value L_{wa}
SC 1850-US	94
SC 2200 & SC 2200-US	94
SC 2500-EV & SC 2500-EV-US	92

The following tables show the selected distances from the inverter and their corresponding sound pressure levels L_{pA} in dB(A) at nominal AC power.

Distance	SC 1850-US	SC 2200 (-US)	SC 2500-EV (-US)
1 m	79	79	77
10 m	66	66	64
20 m	60	60	58
30 m	56	56	55
40 m	54	54	52
50 m	52	52	50
60 m	50	50	49
70 m	49	49	47
80 m	48	48	46
90 m	47	47	45
100 m	46	46	44

Information:

The detailed test report may be requested from SMA Solar Technology AG if necessary.

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CHAMPAIGN CO. P & Z DEPARTMENT

Susan Burgstrom

From: Ted Hartke <tedhartke@hartke.pro>
Sent: Friday, March 30, 2018 12:23 PM
To: Susan Burgstrom
Cc: bbroihahn@news-gazette.com; John Hall; Connie Berry
Subject: March 29th Hartke claims, supporting info about "energy poverty"

Follow Up Flag: Follow up
Flag Status: Flagged

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APR 02 2018

CHAMPAIGN CO P & Z DEPARTMENT

Dear Mr. Hall,

Please forward to the ZBA and ELUC committees:

Last night I think some audience members were surprised I voiced an opinion opposite of the claims that solar energy would "help the poor." In fact, only high-income people can afford to throw money at solar panel installations, and most, if not all, have been paid a subsidy refund from the taxpayers and/or ratepayers.

I countered this claim that renewable energy is more costly for taxpayers AND ratepayers. Renewables have caused increases in the price of electricity and have increased taxes. Renewables have NOT reduced the cost of electricity. Low income families are affected by electricity cost increases the most, as it uses up a higher percentage of their incomes.

This is a link supporting my claims: <http://www.insidesources.com/green-energy-poverty>

This is the article:

Green Energy Poverty: Are Low Income Americans Impoverished by Alternative Energy?

Posted to [Energy](#) April 19, 2017 by [Erin Mundahl](#)

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Sunday is Earth Day. While environmentalist groups are planning marches to support renewable energy development, several groups are pushing back by declaring April 17-21 Green Energy Poverty Week. Their goal is to highlight the effects that green energy policies have on low income households. The term green energy poverty is a variation on global energy poverty, a term that refers to areas of the world without access to electricity. Green energy poverty is defined as a household in which 10% or more of the residents' income is spent on household energy costs (excluding gasoline and other transportation-related costs).

Increased energy prices have a particularly pronounced effect on low income families, for whom energy costs comprise a higher percentage of household income. Energy use is not necessarily proportional to income. In fact, lower income families spend three times more on energy than higher income households.

"Lower-income households fall into something we and others call 'energy poverty,' which is typically recognized as when someone spends just under about 10 percent of their income on energy-related expenses," says DeAndrea Newman Salvador, founder of The Renewable Energy Transition Initiative. "Compared to a middle-to-upper-income household that may spend 5 percent or less, as low as 1 percent, what I found in North Carolina is that a lower-income family can spend greater than 20 percent."

Although states use a variety of different methods of electricity generation, this trend is consistent across the country.

[Analysis of energy consumption survey data](#) and energy price data from the U.S. Department of Energy's Energy Information Administration found that in Mississippi, households with pre-tax annual incomes of less than \$50,000 "spend

an estimated average of 18% of their after-tax income on residential and transportation energy.” This represents 59 percent of Mississippi families. For households in the lowest income bracket, those earning less than \$30,000 annually, spend nearly a quarter of their after-tax incomes on energy.

In some parts of the country, low income families spend half of their income on energy. This is the case for much of Maine and the Dakotas.

These statistics reflect the reality that low income people often live in less energy-efficient homes, meaning that although their overall energy bills may be less than those of middle-income families, they pay more per square foot.

“Lower incomes, less efficient housing, and limited access to energy efficiency programs can explain the higher energy burdens faced by these groups,” write Ariel Dreihobl and Lauren Ross of the American Council for an Energy Efficient Economy. “We found that even though these families paid less overall on energy bills, they paid more per square foot, which indicates the relative inefficiency of their homes.”

According to a 2009 study by the National Bureau of Economic Research, the tax burden of green policies would be three times more expensive for low income households than for middle income ones. This reflects the reality that higher electricity prices raise the prices of many other goods and services. Consumers end up paying for more expensive electricity in the form of higher prices.

Energy prices also affect jobs and economic growth. A study from the Institute on Energy Research found that a 10 to 25 percent increase in energy costs could result in millions of lost jobs, particularly in rural America. The study predicted that “from 2020 to 2040, cumulative job losses in the U.S. [would] range from 18.5 million to 31.3 million and national GDP cumulatively declines by \$2.8 trillion to \$5.4 trillion.”

On the whole, green energy is more expensive than electricity generated through fossil fuels and legislation mandated increased use of wind and solar only exacerbates green energy poverty.

The high costs of green energy are most evident in areas which used legislation to force expensive green energy on consumers. In Britain, customers saw a 15 percent hike in electricity rates this spring. The utility company, Npower, blamed the increase on green energy mandates and renewables obligations. (Britain has set a goal of getting 15 percent of its electricity from renewable energy by 2020. Despite the costs to consumers and industry, it is not presently on track to meet the goal.) In California, where state law requires increased use of renewable energy sources, electricity rates are 40 percent higher than the national average.

A report from the Manhattan Institute went as far as to call California’s green energy policies “a regressive energy tax,” with proportionately higher costs in counties with lower incomes, but higher summer electricity consumption.

“As the Golden State continues its pursuit of a low-carbon economy, its green-energy policies are driving rising numbers of Californians into energy poverty,” wrote Jonathan Lesser, an economist with significant experience in regulated utilities. “In 2012, nearly 1 million households spent more than 10 percent of their income on energy bills.” California has the nation’s highest poverty rate and its energy policies have made life more expensive for millions of its low-income residents.

Liberal groups disagree with the green energy poverty statistics, instead arguing that new technology is making green energy cheaper. However, they acknowledge that energy is more expensive for low income residents.

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About the Author

Erin Mundahl

Erin Mundahl is a reporter with InsideSources.

Susan Burgstrom

From: Connie Berry
Sent: Tuesday, April 03, 2018 9:10 AM
To: John Hall; Susan Burgstrom
Subject: FW: Solar Zoning Changes

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APR 03 2018

CHAMPAIGN CO. P & Z DEPARTMENT

From: Jason Arrasmith [<mailto:harleyowner07@yahoo.com>]

Sent: Tuesday, April 3, 2018 9:08 AM

To: zoningdept <zoningdept@co.champaign.il.us>; jimrandol114@aol.com; deb Priest@comcast.net; fdinovo@gmail.com; Brooks Marsh <1brooks@mchsi.com>; Jim Goss <jegoss64@gmail.com>; Jack Anderson <jackanderson@frontier.com>; johnclifford033@gmail.com; ale7496@yahoo.com; Stan Harper <stancharper@gmail.com>; Bradley Clemmons <BlackandGrey84@gmail.com>; jimmcgul@gmail.com; Jon Rector <jwrector@gmail.com>; Max Mitchell <Max@MaxMitchell.com>; pattsi2@gmail.com; Josh Hartke <ihartke713@yahoo.com>; Pius Weibel <cweibel@co.champaign.il.us>; Kyle Patterson <kyle.patterson1216@gmail.com>; Stephanie Fortado <fortadoccb@gmail.com>; grosales@nitrogenlabs.com; sjh1818@gmail.com; Steve Summers <ssummers@co.champaign.il.us>; Chris Stohr <cstohr.ccbd10@gmail.com>; Robert A. King <rking1045@gmail.com>; James Tinsley <btinsley3@gmail.com>; Lorraine Cowart <lcowart@co.champaign.il.us>

Subject: Solar Zoning Changes

Hello Champaign County Board Members and Zoning Board of Appeals,

My name is Jason Arrasmith. I am a Sidney resident (18 years) and a Sidney Village Trustee (6 years). Last night at our regular board meeting we heard from several residents of the village and county. Everyone at the meeting voiced their concerns about a wide range of topics. Some of the most voiced concerns were noise, visual blight, drainage and decommissioning of the solar farm when it is past it's life. From what I heard from those in attendance most of these issues are not being addressed. The fact that the developer is asking for a noise level to be at 45 dbs is a big concern for the well being of our community. Part of the area they are proposing is directly next to Sidney. 45 dbs is too loud to be that close to a residential area. This project is also taking up good farm land and some of the only land available to be developed with housing.

I am asking that you not change the county zoning to allow this kind of development to be so close to communities. If you feel that it is important to allow this type of growth then please make the rules so that incorporated communities can enforce their mile and one half zoning ordinances. Leaving this out of the change would not only affect Sidney but would leave all other communities in Champaign County open to this kind of development unchecked. The county board and zoning board thought it was important to have that written into the wind farm zoning why shouldn't it be included in the solar farm zoning?

I also think that it is very important that these companies be held responsible for the cleanup and return of the land to its natural state when the leasing of the land is complete. A line of credit is not good enough. To many companies have gone out of business or bankrupt leaving a mess behind for someone else to resolve. We need to protect our communities and our precious farm land. Insist on an escrow account that will cover all costs for the restoration of the land.

Ultimately the Village Board took a straw poll last night and all members present voted not in favor of the project. Please take this into consideration as you discuss this issue. Would you want this next to your community with no say in the matter or anything regulating the development? If you don't at least put the same restrictions as wind farms it could happen to your community next.

Thank You for your time,

Jason Arrasmith

Susan Burgstrom

From: Connie Berry
Sent: Tuesday, April 03, 2018 11:55 AM
To: John Hall; Susan Burgstrom
Subject: FW: solar and wind farm regulations

RECEIVED

APR 03 2018

CHAMPAIGN CO. P & Z DEPARTMENT

From: valerie bernard [<mailto:vhbernard7@gmail.com>]
Sent: Tuesday, April 3, 2018 11:52 AM
To: zoningdept <zoningdept@co.champaign.il.us>
Subject: solar and wind farm regulations

Hello,

Please forward this message to all members of the Champaign County Zoning Board of Appeals!

I am writing as a property owner and lifelong resident of Champaign county, to state on record that I am strongly opposed to allowing solar and wind farms to be built in Champaign county. Our most precious resource is our fertile farm ground, and it should not be used for solar or wind farms that threaten our agricultural productivity, our wildlife habitats, and our quality of life for rural residents.

If these projects are to be allowed, please enact responsible regulations, which include set backs of at least one mile from any residence or incorporated areas. Please do your own research, and consider all of the negative impacts these projects are having on residents and wildlife.

I am specifically opposed to the location of a proposed solar farm near Sidney IL, as it will negatively impact property values, quality of life, agriculture production and aesthetics of that area.

Thank you for passing this message to all Zoning Board members.

Thank you for your consideration when adopting new alternative energy regulations!

Valerie Hopkins Bernard
Philo, IL

Champaign County Zoning Ordinance Minimum Required Separation to Dwelling and Residential District April 5, 2018

Min. req. separation to dwelling and/or residential DISTRICT	Use and Required Authorization (*SUP= Special Use Permit)	Notes
2,000 feet	Plastic & rubber manufacturing; Petroleum refining; Fuel ethanol manufacturing (SUP* in I-2 DISTRICT)	Also requires 300 feet side and rear yard and a 350 feet setback. Apparently mitigating safety, odor, noise, appearance, and overall impact.
1,200 feet (non-partic.) 1,000 feet (partic.)	Wind farm (SUP in AG-1 DISTRICT)	Mitigating safety, noise, overall property impact. Other separations are not included here.
500 feet	Penal or Correctional Institution (SUP* in AG-1, AG-2 DISTRICTS)	Also requires 300 feet side and rear yard and a 350 feet setback. Apparently mitigating noise, appearance, and overall impact.
	Public or Commercial Sewage Lagoon (SUP* in CR, AG-1, AG-2 DISTRICTS)	Also requires 200 feet side and rear yard and a 250 feet setback. Apparently mitigating odor, appearance, and overall impact.
	Blast Furnace; Foundry (SUP* in I-2 DISTRICT)	Also requires 100 feet side and rear yard and a 150 feet setback. Apparently mitigating safety, odor, noise, and overall impact.
	Livestock Sales Facility and Stockyards (SUP* in AG-1, AG-2, B-1 DISTRICTS)	Also requires 100 feet side and rear yard and a 150 feet setback. Apparently mitigating odor, appearance, and overall impact.
	Sewage Disposal Plant (SUP* in CR, AG-1, AG-2, I-2 DISTRICTS)	Also requires 100 feet side and rear yard and a 150 feet setback. Apparently mitigating odor, appearance, and overall impact.
	Slaughterhouse (SUP* in AG-1, AG-2, B-1, I-1 DISTRICTS)	Also requires 50 feet side and rear yard and a 100 feet setback. Apparently mitigating odor, noise, and appearance.
	Amusement park (SUP* in AG-2, B-4, B-5, I-1, I-2 DISTRICTS)	Also requires 50 feet side and rear yard and a 100 feet setback. Apparently mitigating safety, odor, and overall impact.
	LANDSCAPE WASTE PROCESSING FACILITIES (SUP* in AG-2, I-2 DISTRICTS)	Also requires 20 feet side and 30 feet rear yard. Apparently mitigating odor, noise, and appearance.
	Gasoline and Volatile Oils Storage (SUP* in B-1, B-3, I-1, I-2 DISTRICTS)	Additional separation or screening may be required. Apparently mitigating safety, odor, and overall impact.
	Major RURAL SPECIALTY BUSINESS (SUP* in CR, AG-1, AG-2 DISTRICTS)	Side and rear yard and setback same as for DISTRICT. Apparently mitigating odor, noise, and appearance.
300 feet	Meat, fish, and poultry prep. and packaging; Animal fat and oil manuf. (SUP* in I-2 DISTRICT)	Also requires 50 feet side and rear yards and 100 feet setback. Apparently mitigating odor, noise, appearance, and overall property impact.
200 feet	Outdoor Commercial Recreational Enterprise (SUP* in CR, AG-2 DISTRICTS)	Side and rear yard and setback same as for DISTRICT. Apparently mitigating noise and overall property impact.
	KENNEL (SUP* in CR, AG-1, AG-2, B-4 DISTRICTS)	The 200 feet separation is the side and rear yard. Apparently mitigating noise.
	Truck terminal; Railroad Yard and Freight Terminal (SUP* in AG-2 DISTRICT)	Side and rear yard and setback same as for DISTRICT. Apparently mitigating overall property impact.
100 feet	Cemetery or Crematory (SUP* in AG-1, AG-2 DISTRICTS)	Also requires 50 feet side and rear yards and 100 feet setback. Apparently mitigating overall property impact.



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Case 895-AT-18, ZBA 03/01/18,
Supp Memo 7 Attachment G Page 1 of 2



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CHRISTINE WALSH/The County Star

Lynn Rohrscheib talks about trade issues at the Champaign County meeting last week at Monical's Pizza in Tolono.

SIDNEY County ZBA to meet about solar farm on Thursday

By CHRISTINE WALSH
County Star editor

URBANA — A special meeting is scheduled for April 5 to continue discussion on proposed changes to the county zoning ordinance to address solar farms.

The Champaign County Zoning Board of Appeals meeting will begin at 7 p.m. at the Brookens Administrative Center in Urbana.

Last Thursday, the ZBA continued to take testimony about solar farms from area residents and discussed aspects of the planned ordinance.

Colleen Ruhter, who farms in the rural Sidney area where BayWa R.E. is planning to put a 150-megawatt solar farm, said she is not opposed to solar energy per se.

"I would love to see solar panels on the roof of every house," Ruhter said.

However, the planned 7-foot fencing around the solar farm worries Ruhter.

"I'm concerned about being caged in," she said. "It makes for a very claustrophobic experience."

Ruhter said she just found out about the proposed solar farm a few weeks ago from a neighbor and suggested that it be a requirement to notify neighbors of such projects in the future as soon as documents are filed.

Ruhter said she is also

troubled by the potential ecological and environmental impact of the solar farm.

"I'm not a fan of predators, but I do think coyotes and foxes need fields," she said. "How can wildlife have access to areas that are going to be fenced off?"

Ruhter cautioned that if the solar farm developers plan to grow wildflowers from seed around the site, it can be difficult. She said that she hoped only native plants would be used in the landscaping.

Ruhter also wondered about the possibility of combining the use with another one, like chickens, adding that a chicken tractor could "easily" be moved around the panels.

"This would provide a highly beneficial secondary use," she said.

Ruhter said she is also worried about flooding and erosion.

"Many of these fields flood regularly," she said.

Ruhter expressed the opinion that having the fields become fallow would diminish their value.

She also asked for a guarantee that noise levels at the solar farm would not exceed 39 decibels.

Ruhter questioned how the solar farm would affect her property value and how the solar panels would wear in time. She

Please see ZBA A3

Issues among topics Bureau meeting

"Think more about these things," he said.

Trade

Lynn Rohrscheib, a Fairmount farmer who serves as chair of the Illinois Soybean Association, said her organization works to make sure soybean farmers are knowledgeable and successful and that they are producing a sustainable and competitive crop. Rohrscheib cited USDA National Agricultural Statistics Service (NASS) estimates that Illinois farmers raised 11.9 million bushels of soybeans in 2017, making it the top-producing state in the nation.

"We have to make sure there's demand somewhere for that," Rohrscheib said, adding that ensuring high quality and best practices are some of the ways to do that. Iowa is traditionally the next highest-producing state.

"Double-crop pushed us over the

top last year," Rohrscheib said, adding that Iowa also had an unusually rainy season.

Rohrscheib noted that Doug Schroeder of Mahomet is one of 18 volunteer district directors for the ISA.

"He's a great asset to our board," she said.

China alone accounts for 60 percent of all U.S. soybean exports.

"Trade is extremely important," Rohrscheib said.

Some of the U.S.'s assets in trading include the Mississippi River, railways, roads and bridges.

Rohrscheib encouraged farmers to talk to their legislators about lock and dam infrastructure.

"Brazil and Argentina will take our place," she said.

Rohrscheib encouraged farmers to tell their legislators "just how hard that's going to hit the heart-

Please see FARM A3

ZBA

from A1

asked about the possibility of neighbors being given their own solar panels on their property to derive some of the benefit from the project.

Jeff Justus, who farms in the Sidney area, encouraged the ZBA to consider the importance of drainage tile.

He said much of the clay tile put in years ago requires maintenance.

"If water can come out and go to the ditch, the people upstream are ticked off," Justus said. "It just creates lakes and less of income. It can affect lots of farms and acres. If we cover this land with solar panels, how do we go in and repair it? There's no way to get a backhoe in there to fix it."

Justus also suggested that fencing around the solar farm could become damaged by snow and become unsightly. He also said a solar farm could hurt the local economy because crops grown in the area are usually taken to the Premier Cooperative elevator or to the Frito Lay plant.

"It does affect our local businesses as well," he said. Savoy resident Anne Parkinson expressed her support for a solar farm in Champaign County.

"You guys are so for-

ward thinking and intelligent in protecting our land and water," Parkinson said, adding that agriculture has a challenge in being able to feed a growing population. "We're really at the mercy of global competition and whether or not California has a drought. Solar is under our control. I'm all for putting it wherever we can put it. Champaign County has always been on the forefront of change."

Farmer Daniel Herriott said he intends to continue living in the Sidney area for the rest of his life.

"Put a great deal of thought into what does this look like in year 25," he urged the ZBA members, adding that he is especially concerned about what would happen if BayWa abandons the Sidney solar farm.

ZBA Chair Catherine Capel explained that under the proposed ordinance, a solar farm company would be required to have an escrow account that the county could draw against to pay for decommissioning.

BayWa R.E. Director of Development Patrick Brown reiterated a request he made to the ZBA at its last meeting that the ordinance require only a letter of credit rather than an escrow account.

"Lines of credit are very stable," he said.

While Brown said he

agreed that screening needed to be provided around the solar farm, he asked the board for some "discretion" in case there were neighbors who didn't want it.

In response to Justus' concerns about drainage, Brown said BayWa would be hiring a surveyor to locate drainage tiles.

"The landowners want us to preserve their drainage tiles," Brown said. "We also have an incentive to do it because we don't want a flooded-solar farm."

Brown compared the solar farm to a metal toy construction set with 10-foot-wide rows between the solar panels.

"You can get a mini excavator in (to repair tiles)," he said. "And if you have to take the modules out, it's not that much work."

ZBA member Debra Griest told Brown to educate himself on Illinois drainage law and emphasized the difference between privately owned tiles and drainage district tiles.

"Drainage districts have rights you will need to learn about and respect," Griest said. "The drainage tile is what makes Champaign County farmable."

Rev. Cindy Shepherd of Urbana, the director of the Central Illinois Office of Faith in Place, said her organization is excited

Farm

from A1

land. We have to start speaking out more and more since there are fewer

ly in Taiwan and China, Rohrscheib said.

Illinois grew about 11 million acres of soybeans last year. If Illinois were a country, it would be the

about the proposed solar farm for two reasons.

"Carbon-based pollution endangers our children and families," Shepherd said.

And, she said, renewable energy is a way to help the economically disadvantaged.

Shepherd said that Champaign County currently has 54 clean-energy jobs and that she would like to see that number increase.

"Forty-three percent of Champaign County residents rent - and they're not all students - so they can't put solar on their house and reap those benefits," she said.

People who don't have the right kind of roof or who have too many shade trees can't have solar installations either, Shepherd said.

Shepherd said that by switching from energy generated by coal, oil or nuclear power, total energy bills could be reduced by 15 to 20 percent. Low-income residents spend close to 27 percent of their incomes on energy, according to Shepherd.

"Affordable energy is when someone pays 6 percent," she said. "Please don't think you're just impacting fat cat solar developers or landowners."

By making an ordinance that is too restrictive, Shepherd said, the county could affect non-

The department has 18 field staff members who investigate complaints. They are the same people who proctor exams for pes-

profits and "vulnerable neighbors."

"They won't be able to choose what they would choose otherwise," she said.

Rural Sidney resident Ted Hartke encouraged the ZBA to follow the lead of Knox, Tazewell and Whiteside counties, which require 500 feet of separation between solar farms and adjacent dwellings, rather than the 100 feet in the proposed ordinance.

Hartke objected to Champaign County Director of Planning and Zoning John Hall's statement that with a solar farm, neighbors would not be affected by more houses coming in and the disruptions from planting, harvesting and fertilizing associated with agricultural use.

Hartke countered that planting, harvesting and fertilizing usually only take one day each and that the proposed solar farm area is unlikely to be developed into a subdivision anytime soon since Sidney has no sanitary sewer system.

However, he said, noise from the solar farms would last from sunrise to sunset on an average of 280 days each year.

"I think that is theft of their (neighbors') property," Hartke said.

Hartke argued against Shepherd's claim of renewable energy being helpful

A determination letter is then issued, stating whether or not there was enough evidence that the Illinois Pesticide Act was

to the economically disadvantaged, saying that most, if not all, solar installations have been paid for through subsidy refunds from taxpayers or ratepayers.

Hartke pointed the ZBA to a 2009 National Bureau of Economic Research study that indicated that the tax burden of green policies would be 300 percent more expensive for low-income households than for middle-income households. He also cited statistics that in Britain, customers experienced a 15-percent increase in electricity rates last spring that utility company Npower blamed on green energy mandates and renewables requirements.

ZBA member Frank DiNovo said that the change in use would not affect the best prime farmland the way some other changes might.

"It's not gone forever," he said. "It's just converted temporarily."

"I would say it's a manager that's recoverable," Griest said.

DiNovo said he was bothered by the notion that neighbors who had bought properties in the area with expectations about what their surroundings would be would suddenly be put in a situation in which they would be completely surrounded by an 8-foot barrier.

Moines Water Works went to court to force Iowa farmers to pay to clean the city's drinking water. "These groups are com-

Susan Burgstrom

From: John Hall
Sent: Thursday, April 05, 2018 2:47 PM
To: Susan Burgstrom
Subject: FW: PF Solar Farm Seed Mix

From: Manuel, Jonathon - NRCS-CD, Champaign, IL [<mailto:Jonathon.Manuel@il.nacdnet.net>]
Sent: Thursday, April 5, 2018 1:28 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: FW: PF Solar Farm Seed Mix

Hi,
Hey not sure if you are interested in know this seed mix below. I think I might be attaching it to any NRI's in the future. Hope you are having a great week.

Jonathon Manuel CPESC-IT
Resource Conservationist
Champaign County Soil and Water Conservation District



From: Jason Bleich [<mailto:jbleich@pheasantsforever.org>]
Sent: Thursday, April 05, 2018 12:57 PM
Cc: Kristi Ford <kford@pheasantsforever.org>
Subject: PF Solar Farm Seed Mix

Good afternoon SWCD partners!

There is currently a HUGE push for solar power in Illinois and we're working with multiple SWCDs, County Boards, and solar power companies to promote pollinator-friendly habitat on solar farms.

We finalized our PF Solar Farm mix last week. It's going to be \$325/acre. 19 species and the height will be about 24".

Took some time to get this mix where we wanted it. Lots of factors with solar farms... height, affordability, pollinator-friendly species, diversity, and making sure we get 80% ground cover in the first growing season.

It's now listed in the pfhabitatstore.com website under Regional Mixes. As of now, it can be ordered and shipped in 7-10 days. Click on link below:

<https://www.pfhabitatstore.com/store/11608/RM/Solar-Farm-Mix>

Let me know if you have any questions!

Jason Bleich - Conservation Specialist
Pheasants Forever, Inc and Quail Forever
(217) 855-0496 | jbleich@pheasantsforever.org

Visit our online store at www.pfhabitatstore.com

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Illinois Soil Conservation and Revitalization Using Native Vegetation

Findings and Recommendations

Prepared for Cypress Creek Renewables, LLC

August 21, 2017

Tim O'Connor

Ecobiologist, Fields of Green

17907 Schmidt Road, Mount Carroll, IL 61053
815-297-3394
Fieldsofgreen96@gmail.com

Executive Summary

Purpose of this report

Taking land out of agricultural production is a topic of great public concern. The hosting of solar energy production facilities on agricultural land is not a permanent land use conversion.

Committed to addressing challenges related to the land, soil, property owners, and communities near or on their solar farms, Cypress Creek Renewables, LLC has commissioned this report to aid in the development of its Illinois land stewardship program. This program is intended to ensure that host land is not only conserved, but improved while remaining compatible with neighboring agricultural lands over the life of Illinois solar farm facilities.

This report provides thoughtful consideration, information for understanding, and recommendations of practices and scenarios for the land that will host solar farms in Illinois.



It is beneficial for agricultural land to lie fallow while hosting a solar farm, allowing the natural biological process to rejuvenate the soil for future generations.

Natural processes increase soil organic matter, soil fertility, soil tilth, and a host of other soil benefits. Cypress Creek Renewables, LLC can create a positive effect on the land by planting and maintaining native plants that restore and replenish the soil. Illinois, "The Prairie State," has only one-hundredth of one percent of its original prairies. (Madson, 1993) By reestablishing native Illinois prairies, the company will help increase biodiversity, intensify organic matter, and prevent soil erosion.

History of Soil in Illinois

When French explorers came across Illinois, they encountered the vast grassland they called “prairie.” Illinois is blessed with productive soils today because of the prairie ecosystem. Over thousands of years of decomposing organic matter, mostly from the deep root structures of these plants, has created the rich, dark, fertile soils in Illinois today. Therefore, it only seems fitting to reintroduce this prairie ecosystem as a “cover crop” for solar farms.

Current State of Farmland Soils

Unbroken prairie soils contain as much as 10-15% organic matter. Because of the intensive tillage of Midwestern soil, organic matter has plummeted in some locations to below one percent of total soil volume. Commercial agriculture’s unceasing growth causes stress to the soils. For producers to continue to grow crops at current levels, they apply more chemical fertilizer to increase yields, apply more fungicides to keep plants healthier, and remove other ecosystems to make room for more row crops. The soil’s health declines.

Resting soil (soil that is taken out of production) remedies itself to a healthier state as the natural processes are reestablished. Temporarily removing agricultural land out of production is not a new concept. Programs like Conservation Reserve Program (CRP) and State Acres for Wildlife Enhancements (SAFE) have been around for many years. These programs successfully reduce soil erosion, improve water quality, increase habitat, and attract pollinators.

Benefits of Cover Cropping with Native Illinois Grasses

Cover cropping with native grasses creates biomass both above and below ground, and over time, improves the integrity of the soil because it:

- increases organic matter;
- improves microbial activity;
- prevents compaction;
- improves water infiltration;
- controls water run-off and erosion;
- slows movement of soil particles.

Organic matter and microbial activity

In the book, *Building Soils for Better Crops*, Authors Magdoff and Van Es discuss the benefits of cover cropping, “Grass cover crops are more likely than legumes to increase soil organic matter. The more residue you return to the soil, the better the effect on soil organic matter.” (102) Organic matter is the key to soil quality. Agricultural topsoil usually contains about 1-6% organic matter. Magdoff and Van Es cite a Michigan soil study that demonstrated potential crop yield increases of about 12% for every 1 % of organic matter. Additionally, Maryland

researchers logged an increase of about 80 bushels of corn per acre when organic matter was increased from 0.8% to 2%.

As organic materials in the soil such as the biomass created by native grasses above and below ground, decompose the process of mineralization releases nutrients into the soil. The ability of organic matter to hold on to cations, which are essential positively-charged plant nutrients, is known as cation exchange capacity (CEC), the higher the CEC the higher the soil quality.

Water run-off, infiltration, erosion, and soil movement

Cover cropping with native grasses is one of the best ways to help build soil profile. Soils tend to become less compact, having space for air passage and water movement as organic matter increases. The soil is said to have Good Tilth. These soil qualities are especially enhanced by native vegetation with typically long roots that, depending on the species, can reach average depths of 5 to 7 ft. and as much as 15 ft. Soil moves every time it rains, even in a sod situation. Soil movement unsurprisingly intensifies in a tilled field. Growing deep-rooted native plants on farmland slows the movement of soil particles, increases infiltration of water, and raises the water holding capacity of soil.

Rejuvenated soil

By reestablishing these native prairies as a “cover crop” for solar farms, biodiversity is increased, organic matter intensified, and soil erosion prevented. Resting agricultural land with cover crops remedies itself to a healthier state as the natural processes are reestablished. Over the 20 – 40-year life of the solar facility, land will become healthier and rejuvenated for future generations of production agriculture.

Vegetation Types Suitable for Solar Farms

A baseline quality soil sample should be taken at each site. The sample analysis identifies problems with soil PH, nutrient quantities, and organic matter. Amendments to the soil can be made before the prairie planting begins, if desired. Due to the unique circumstances of solar farms, only short prairie grasses ranging from 2 to 2.5 feet in height should be planted. Mowing is also an option as it will not affect the integrity of the prairie.

Seed mixes from native plant nurseries will be dependent on specific site soil and sun conditions. Most seed companies are willing to put together a seed mix that is suited for individual sites. Working with a reputable native seed company is important for the success of the prairie. Prices vary considerably when dealing with prairie plantings. Plant species and price quotes per acre from a reputable seed dealer have been included in this report.

Some Recommended Shortgrass Prairie Grasses and Sedges*

<i>Botanical name</i>	<i>Common Name</i>	<i>Height</i>
Schizachyrium scoparium	Little Blue Stem	2-3 ft.
Bouteloua curtipendula	Side-oats Grama	2-2.5 ft.
Sporobolus heterolepis	Prairie Dropseed	2-3' ft.
Muhlenbergia racemosa	Upland Timothy	2' ft.
Carex brevoir	Plains Oval Sedge	1' ft.

Viability and height of grasses will vary due to soil and light conditions specific to the site. A site and soil analysis is always recommended to determine the best species for the location.

*Height information above derived from *Illinois Wildflowers* (Hiltey) and Prairie Moon Nursery website: www.prairiemoon.com (see attachment)

Establishing the Native Illinois Grass Cover Crop



On-site preparation

The most successful project starts with on-site prep work.

Elimination of all existing plant material is the first step. This can be accomplished by a series of sprayings. Controlling non-targeted species needs to be a priority. Research, evaluation of each site, and talking to local producers can provide insight as to the main invasive species and how to best control.

Drill grasses and nurse crops first. Planting a nurse crop with the prairie grasses helps control weeds and soil moisture retention. Oats has been a successful nurse crop for this function. No-till drilling of prairie seeds is highly recommended and reduces the amount of seed required. Conventional planting practices i.e. plowing and disking allow for more unwanted

seeds in the germination zone, resulting in a flush of undesirable plants that cause complications.

Wild flowers

It may take 1-2 years to fully establish the grass prairie at which time the native prairie flowers (forbs) can be drilled, if desired. Please note, many native prairie flowers exceed the height constraints of a solar facility. Shorter native prairie flowers include Blazing Star, Heath Aster, and Lead Plant.



Typical short grass prairie with wild flowers (forbs) located in Mt. Carroll, IL. Note that the flowers shown exceed 2.5 ft. and are not suitable for use with a solar facility.

Maintenance and weed control

During the first year, growth of grasses occurs predominantly underground. About 80 percent of broadleaves can be controlled by mowing at a height of 10-12 inches. These practices help control broadleaves and other invasive species along with aiding pollinators. The planting of multiple species naturally helps to control weeds and diseases. Although never maintenance free, once a prairie has been established for 3-5 years, it becomes easier to manage.

References and Additional Resources

Illinois Invasive Plant List. Center for Invasive Species and Ecosystem Health.

<https://www.invasive.org/species/list.cfm?id=152>

Illinois Wildflowers. John Hilty. <http://www.illinoiswildflowers.info/> (detailed, searchable website for native herbaceous plants in Illinois)

Madson, John. 1993. *Tallgrass Prairie*. Nature Conservancy/Falcon Press

Magdoff, Fred and Van Es, Harold. 2009. *Building Soils for Better Crops*. nit Book Press

PRAIRIE MOON® NURSERY

SHORTGRASS INEXPENSIVE PRAIRIE SEED MIX

12.36 lbs per acre | 86 Seeds per sq/ft

FORBS	
Botanical Name (Common Name)	% by wt.
Allium stellatum (Prairie Onion)	0.51
Asclepias tuberosa (Butterfly Weed)	1.01
Aster laevis (Smooth Blue Aster)	0.25
Astragalus canadensis (Canada Milk Vetch)	0.38
Baptisia alba (White Wild Indigo)	1.01
Chamaecrista fasciculata (Partridge Pea)	8.09
Coreopsis lanceolata (Lance-leaf Coreopsis)	4.05
Dalea candida (White Prairie Clover)	3.03
Dalea purpurea (Purple Prairie Clover)	4.05
Echinacea pallida (Pale Purple Coneflower)	2.02
Heliopsis helianthoides (Early Sunflower)	2.02
Lespedeza capitata (Round-headed Bush Clover)	1.01
Penstemon digitalis (Foxglove Beardtongue)	0.76
Pycnanthemum verticillatum var. pilosum (Hairy Mountain Mint)	0.51
Rudbeckia hirta (Black-eyed Susan)	4.05
Senna hebecarpa (Wild Senna)	2.02
Solidago rigida (Stiff Goldenrod)	0.51
Verbena stricta (Hoary Vervain)	1.01
Total of FORBS	36.28

GRASSES, SEDGES & RUSHES	
Botanical Name (Common Name)	% by wt.
Bouteloua curtipendula (Side-oats Grama PLS)	26.07
Bouteloua gracilis (Blue Grama PLS)	8.78
Bromus kalmii (Prairie Brome PLS)	3.52
Muhlenbergia racemosa (Upland Wild Timothy)	1.26
Schyzachyrium scoparium (Little Bluestem PLS)	24.09
Totals of GRASSES, SEDGES & RUSHES :	63.72

Last updated 2/2/17

SEED MIXES

500 sq ft	\$19.00
1000 sq ft	\$28.00
1/8 acre	\$86.00
1/4 acre	\$172.00
1/2 acre	\$344.00
1 Acre	\$687.00



PRAIRIE MOON® NURSERY

SHORTGRASS PRAIRIE SEED MIX FOR MEDIUM SOILS

14.72 lbs per acre | 118 Seeds per sq/ft

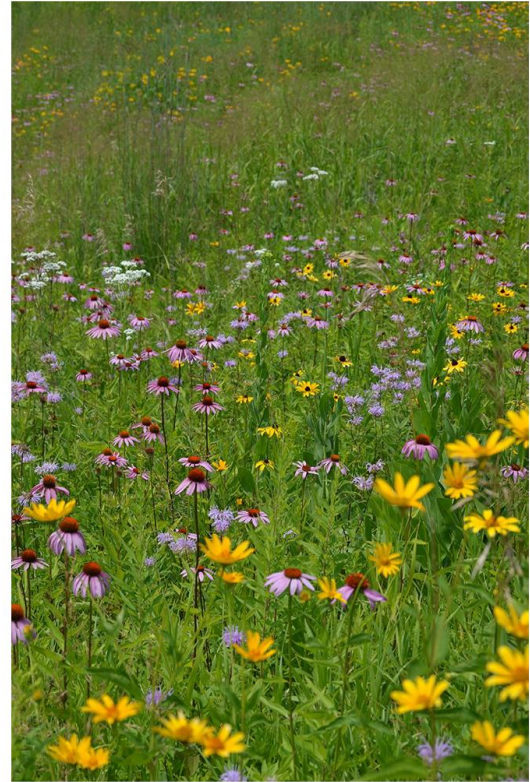
FORBS	
Botanical Name (Common Name)	% by wt.
Allium stellatum (Praise Onion)	2.12
Asclepias incarnata (Rose Milkweed)	3.4
Aster laevis (Smooth Blue Aster)	1.06
Baptisia alba (White Wild Indigo)	0.85
Baptisia bracteata (Cream Wild Indigo)	0.85
Coreopsis lanceolata (Lance-leaf Coreopsis)	1.7
Dalea candida (White Prairie Clover)	3.4
Dalea purpurea (Purple Prairie Clover)	3.4
Dodecatheon meadia (Midland Shooting Star)	0.74
Echinacea pallida (Pale Purple Coneflower)	5.09
Echinacea purpurea (Purple Coneflower)	1.7
Eryngium yuccifolium (Rattlesnake Master)	1.7
Gentiana flavida (Cream Gentian)	0.85
Liatris pycnostachya (Prairie Blazing Star)	5.09
Liatris spicata (Marsh Blazing Star)	2.12
Lobelia spicata (Pale Spiked Lobelia)	0.42
Parthenium integrifolium (Wild Quinine)	2.55
Penstemon digitalis (Foxglove Beardtongue)	1.27
Physostegia virginiana (Obedient Plant)	0.85
Pycnanthemum virginianum (Mountain Mint)	0.64
Rudbeckia hirta (Black-eyed Susan)	2.55
Ruellia humilis (Wild Petunia)	1.27
Solidago speciosa (Showy Goldenrod)	0.42
Tradescantia ohioensis (Ohio Spiderwort)	2.55
Zizia aurea (Golden Alexanders)	1.7
Total of FORBS	48.28

GRASSES, SEDGES & RUSHES	
Botanical Name (Common Name)	% by wt.
Bouteloua curtipendula (Siskin-coat Grass PLS)	13.78
Bromus kalmii (Prairie Brome PLS)	13.78
Carex biewior (Prairie Oval Sedge)	1.85
Carex modesta (Field Oval Sedge)	1.85
Schizachyrium scoparium (Little Bluestem PLS)	18.47
Sporobolus heterolepis PLS (Prairie Dropseed PLS)	1.98
Totals of GRASSES, SEDGES & RUSHES :	51.72

Last updated 12/6/16

SEED MIXES

500 sq ft	\$39.00
1000 sq ft	\$68.00
1/8 acre	\$314.00
1/4 acre	\$627.00
1/2 acre	\$1,253.00
1 Acre	\$2,505.00





UIUC Solar Farm
distance: ~50 feet to closest panel
on left of road
04/05/18



UIUC Solar Farm
distance: ~50 feet to nearest panel
04/05/18



UIUC Solar Farm
distance: ~90 feet to nearest panel
04/05/18



UIUC Solar Farm
distance: ~200 feet to closest panel
04/05/18



UIUC Solar Farm
distance: ~250 feet to closest panel
(arrow) taken from railroad tracks
04/05/18



UIUC Solar Farm
distance: ~500 feet to panels straight
ahead (arrow)
04/05/18