

Hardin Solar

Hardin County, Kentucky
Public Information Meeting
August 26th, 2021

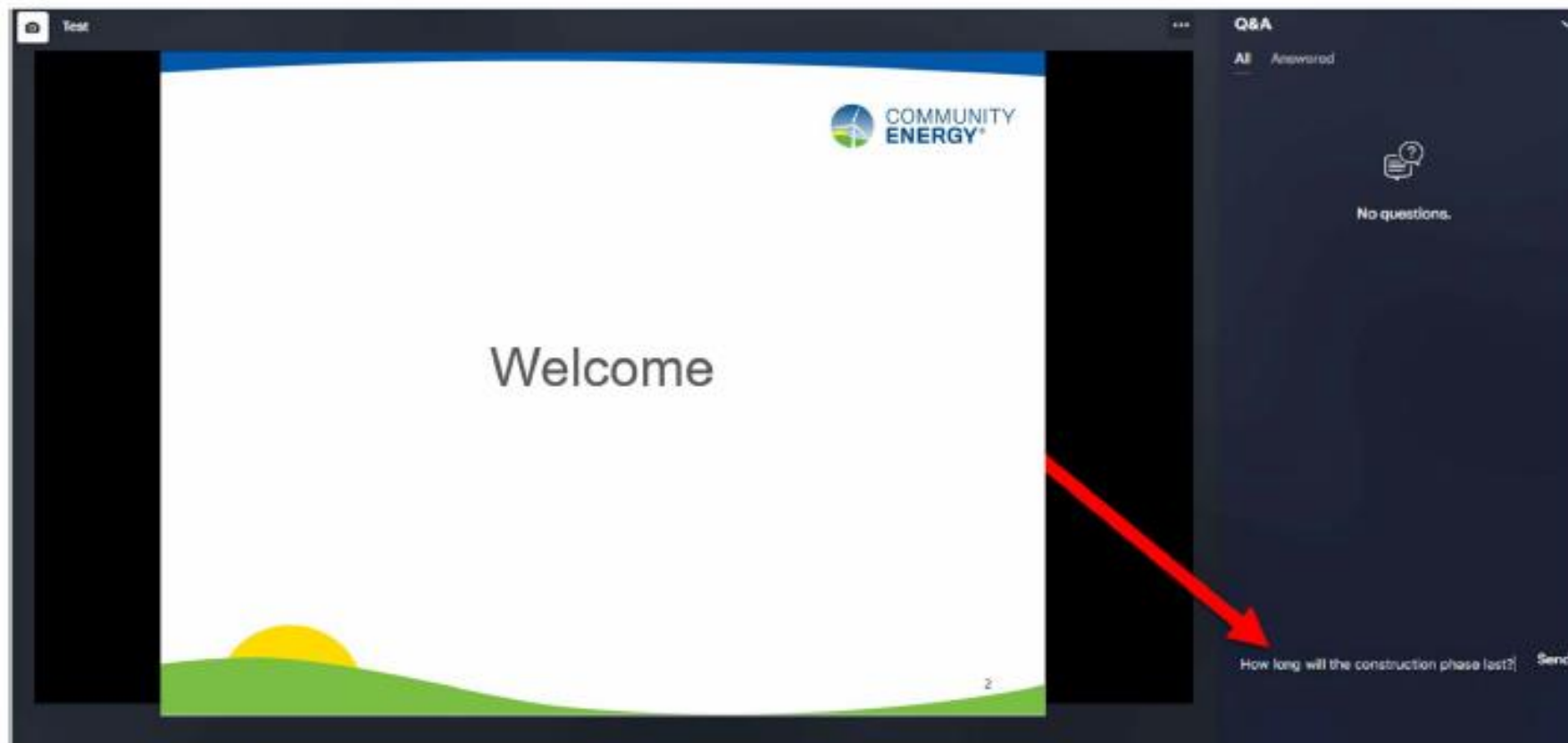
The presentation will start momentarily.



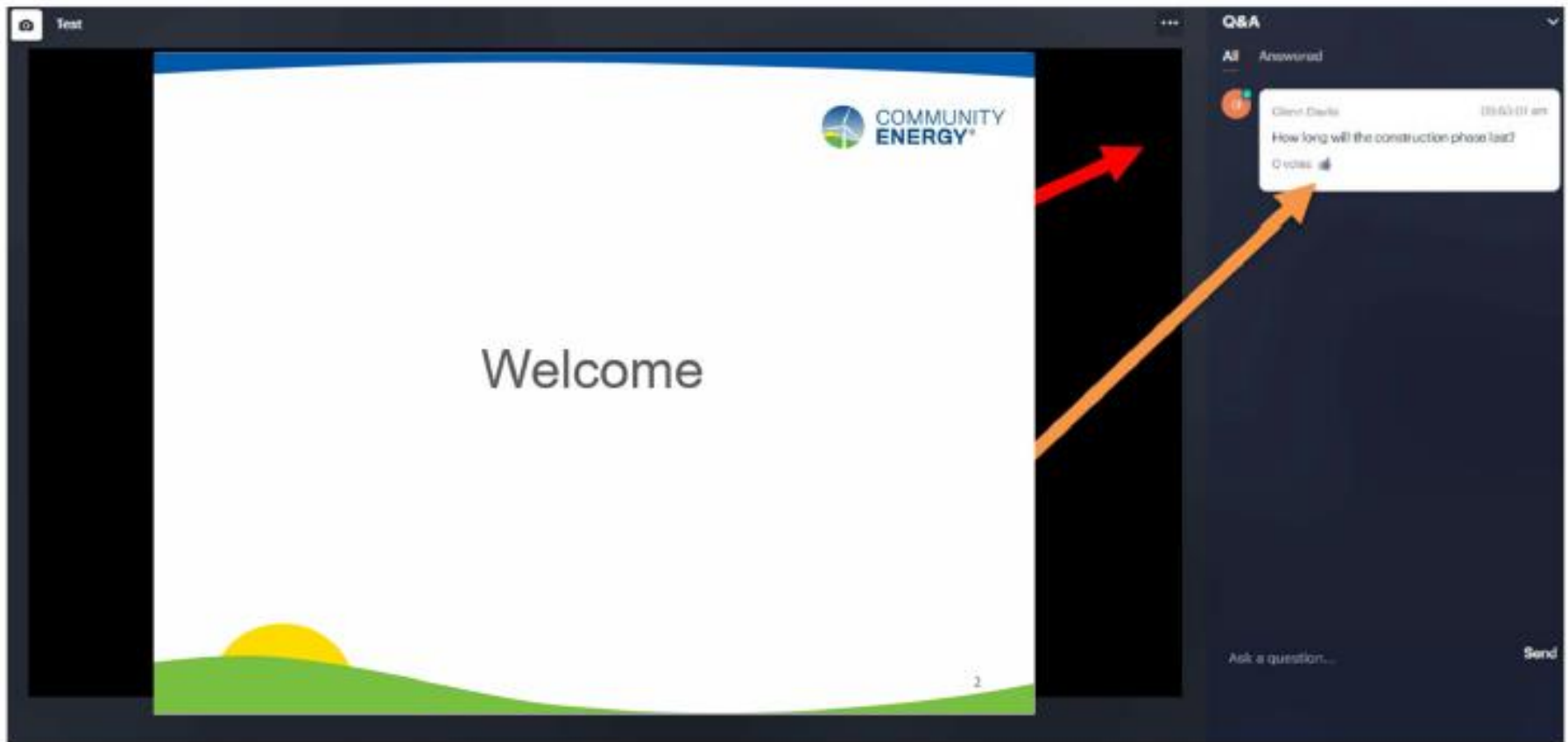
Welcome



How to ask a question



How to ask a question (continued)



Presenters

Chris Killenberg

Regional Development Director
Community Energy



Tom Tuffey

Principal
Community Energy



Lauren Brunsdale

Project Developer
Community Energy



About Community Energy



Proven Track Record. Since our founding in 1999, CE has developed and financed over 2,700 megawatts (MW) of solar and wind power. This includes solar projects ranging from 1MW to 200 MW each, across 19 states.

Experience. The CE team has worked together for over 22 years as a leader in the developer of renewable energy projects (especially in new markets).

Alignment with Landowners and Communities. Community Energy seeks to be a good neighbor by working closely with local partners so that our project supports community needs for the long-term.

We Care. We care about developing long term relationships with communities and our project partners for shared success.

Successful, experienced and trusted.



22+ years

of experience
working together as
a team



2,000+ MW

of solar PV projects
developed to date



700+ MW

of wind projects
developed to date

Presenters

Marty Marchatterre

Senior Environmental Planner
Copperhead Environmental Consulting



Copperhead Environmental Consulting, LLC

- Multi-discipline environmental consultant
- In business 16 years
- Headquarters in Paint Lick, KY



Presenters

Josh Valentino

Senior Geologist

Terracon



Terracon

- Multi-discipline consulting and engineering
- In business 56 years
- More than 150 offices from coast to coast.

Terracon
Consulting Engineers & Scientists

Presenters

Rich Kirkland

Commercial Appraiser, MAI
Kirkland Appraisals



Kirkland Appraisals, LLC

- Commercial real estate appraiser
- In business 17 years
- Offices in Raleigh, NC
- Kentucky State Certified General Appraiser



Presentation Outline

- **Introduction**
- **Description**
 - Why Hardin County?
 - What is a Solar Project?
- **Project Site**
 - Project Site Description
 - Project Layout
 - Environmental & Permitting Studies
- **Permits**
 - County Permitting
 - State Permitting
- **Operations**
 - Construction
 - Operations and Maintenance
 - Output
 - Community Benefits
- **Summary**

Description of the Project

About Hardin Solar

Hardin Solar is a proposed:

- 85-megawatt solar project, which will produce enough energy to power over 16,000 homes
- Located on approximately 650 acres across six parcels in central Hardin County
- Will connect to an East Kentucky Power Cooperative (EKPC) transmission line. EKPC transmits power to Nolin RECC



Elizabethtown College Solar, PA

Why Hardin County?

The core components of siting a solar project are: (1) access to a transmission line with available capacity to allow us to produce affordable, reliable power for consumers, (2) suitable land and most importantly (3) landowners that want to participate in a solar project.

Hardin County has 2x the amount of transmission lines as a typical area because there are two overlapping utility territories within the county.

Community Energy is working with landowners that are voluntarily choosing to participate in this project to diversify a portion of their farm and to preserve their family farm for future generations.



Elizabethtown College Solar, PA

What is a Solar Project?

A solar project is essentially a power plant that converts sunlight to electricity.

The basic building block of a solar farm is a solar panel.

Solar panels are rectangular, about 3 ft wide and 5 ft tall. They're black or dark blue, with glass on top.

A solar project is just a whole lot of solar panels, bolted to a racking system, and placed in a field.

They operate for 30 years with no audible noise, no smell, and minimal maintenance.



Elizabethtown College Solar, PA

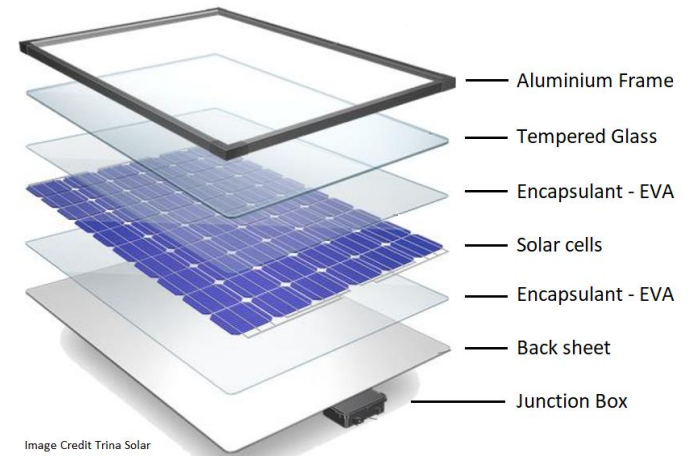


North Star Solar, MN

Components of a Solar Project:

Crystalline Silicon Photovoltaic Panels

- Proven and touch safe technology
- 30-year warranty
- Primary materials:
 - Glass (+/- 85%)
 - Aluminum (+/- 8%)
 - Silicon (+/- 6%)
 - Wiring (+/- 1%)
 - Wiring is typically made of made of copper, silver, and zinc.
- Of these materials, 95% of the glass, 100% of the aluminum and 85% of the silicon is recyclable. Solar panel recycling programs are already in place in the U.S.



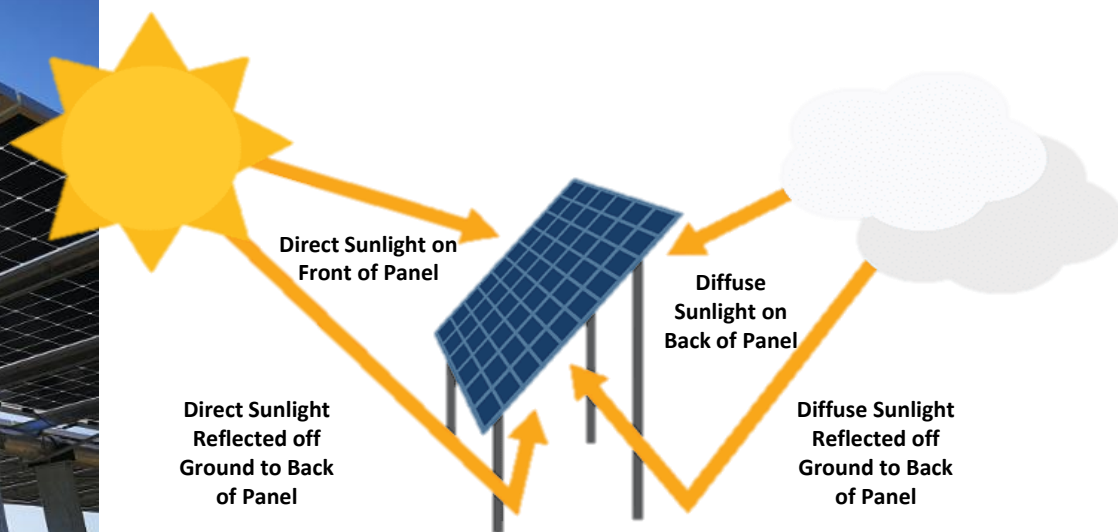
Example of touch safe technology at Keystone Solar, PA

Components of a Solar Project:

Bifacial Panel Technology



Example of bifacial solar panels



Innovation in the last few years now allows us to use both sides of the panel to collect energy from the sun!

Components of a Solar Project:

Racking

The proposed solar project will use a '**Single-Axis Tracking System**' – a rotating racking system that will follow the sun from east to west.



Example of solar panel rotation at North Star Solar, MN

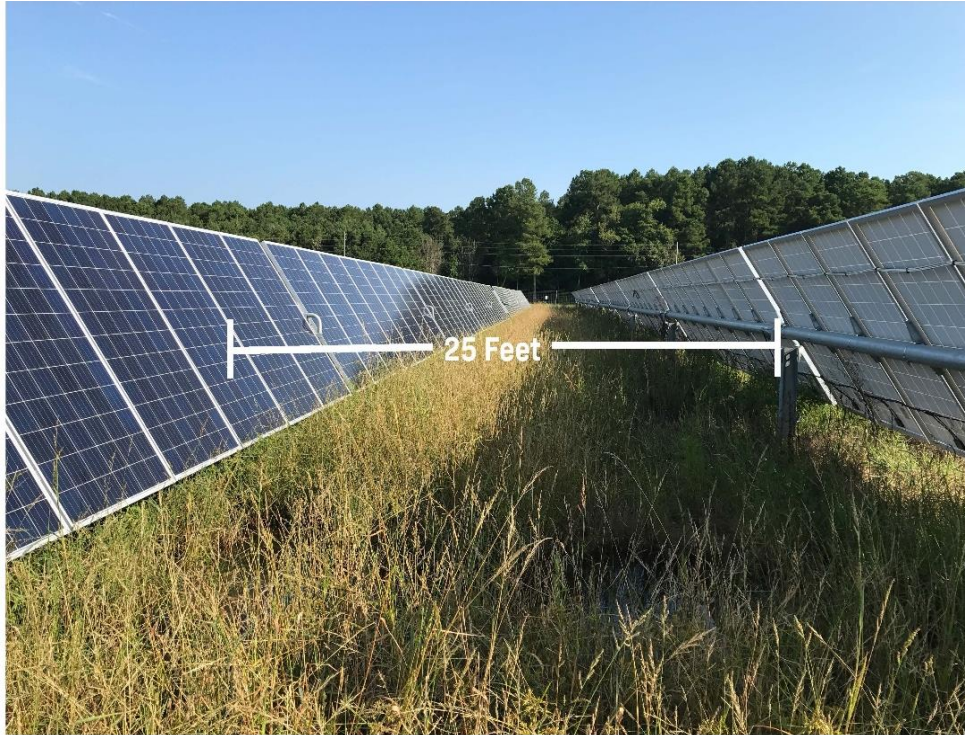


Example of solar panel rotation at
Amazon Solar, VA

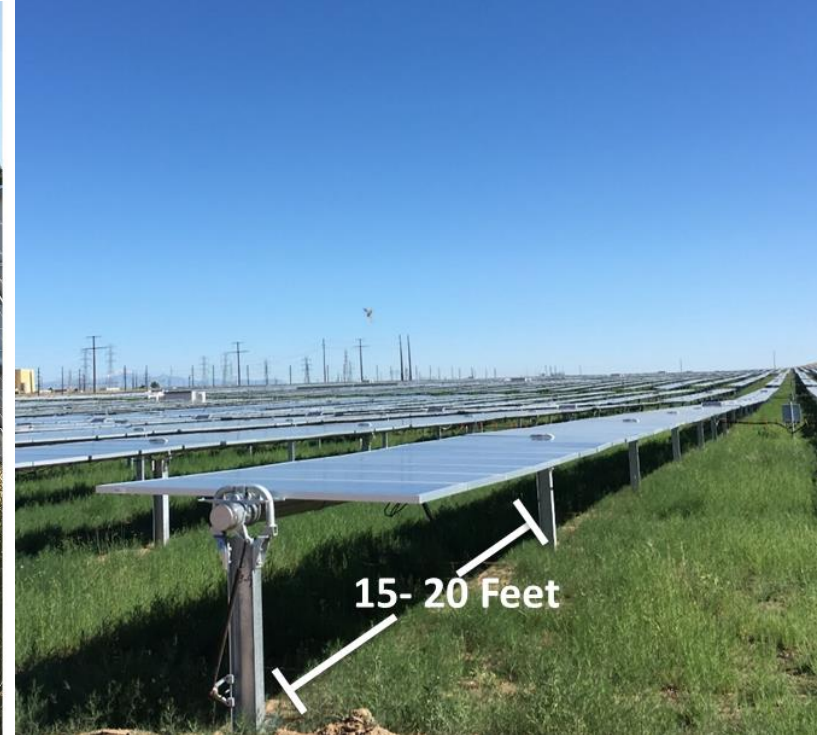
New solar panels track the sun like a young sunflower

Components of a Solar Project:

Space Between Rows & Posts



Example of space between panels at Amazon Solar, VA



Example of space between posts at Comanche Solar, CO

Allows for full establishment of ground cover. 18

Components of a Solar Project:

Inverters

Solar panels produce 'DC' power (the same as in a car battery).

An 'Inverter' changes the power from 'DC' power to 'AC' power (the same as you use in your home).

Inverter stations will be located throughout the interior of the solar project at a minimum distance of 800 feet to any home.



Example of Solar Inverter at Elizabethtown College Solar, PA



Example of Solar Inverter at Keystone Solar, PA

Components of a Solar Project:

Transformers

Solar panels produce low-voltage electricity. Transformers are used to increase the voltage to a usable level.

“Step-up Transformers” within the solar project increase the voltage to a level similar to the typical voltage in the power lines that run along roads.

A “Main Transformer” at the project substation increases the voltage again, to the level in the transmission line.



Example of solar transformer at Elizabethtown College Solar, PA



Example of residential transformer box for reference

Components of a Solar Project:

Project Substation

To connect the solar farm to East Kentucky Power Cooperatives' transmission line, a substation will be built on the project site.

Underground power lines will be used to connect the solar arrays to the project substation.

The project substation will be visually screened with vegetative plantings from the roadway and nearby residences.



Example of substation with vegetative screening



Example of substation with vegetative screening

Components of a Solar Project:

Security Fence

The array areas will be behind an approximately 7-8ft tall agricultural style fence (woven wire with wooden posts).



Example of agricultural style fencing at Amazon Solar, VA



Fence at Elizabethtown College Solar, PA

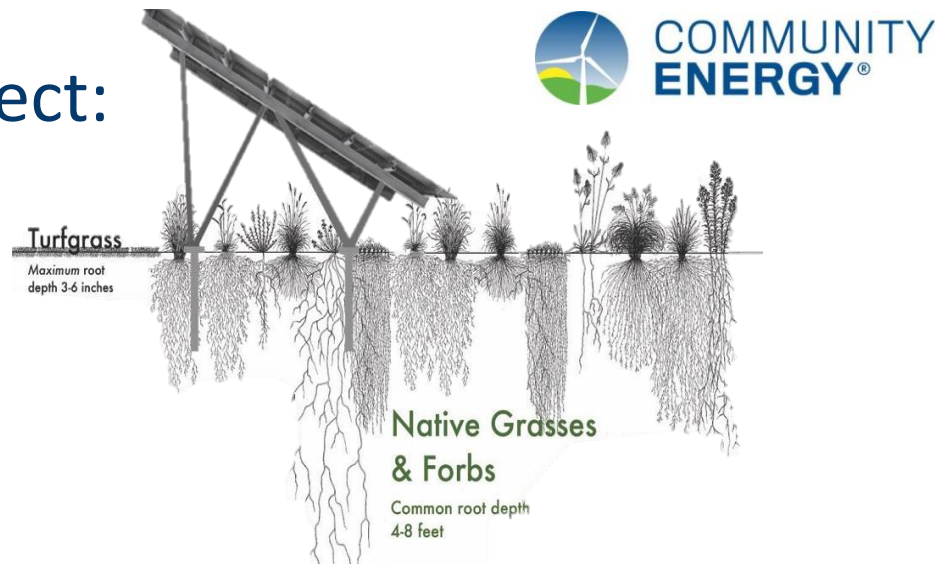


Example of agricultural style fencing at North Star Solar, MN

Components of a Solar Project: Ground Cover

Low-growing prairie-type grasses such as a mix of fescue, native species, and clover will be planted throughout the project area to establish a strong sod.

The solar seed mix is designed to build the organic content of the soil, minimize erosion and capture stormwater runoff. The area beneath and between the panels consists of pervious soil and well-maintained vegetation to capture rainwater and allow it to infiltrate the ground.



Example of ground cover at Elizabethtown College Solar, PA

Components of a Solar Project: Pollinator & Livestock Friendly Seed Mix

We have with bee farmers at two of our existing projects to host beehives onsite to support their local honey business. Currently testing a rotational sheep grazing program on other project sites that could influence future maintenance management processes.



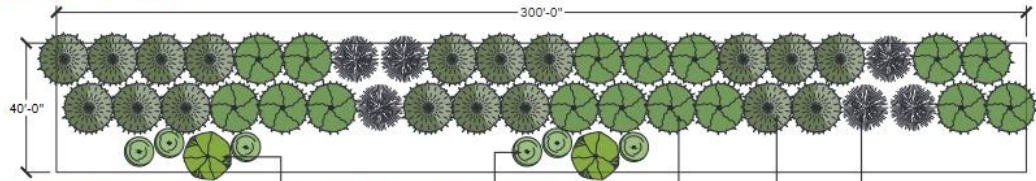
Beekeepers and a pollinator seed mix at North Star Solar, MN



Our mowing team at Mt. Olive Solar, NC

Components of a Solar Project: Professional Landscaping

RURAL RESIDENTIAL LANDSCAPE TREATMENT PLANS



Project Site

Project Site

The project site is comprised of two sections: one section off N. Long Grove Road, and one section off S. Long Grove Road.

Most of the project site is currently open land used for row-cropping.

Six different farming families are participating in the project through long term lease agreements and easement agreements.

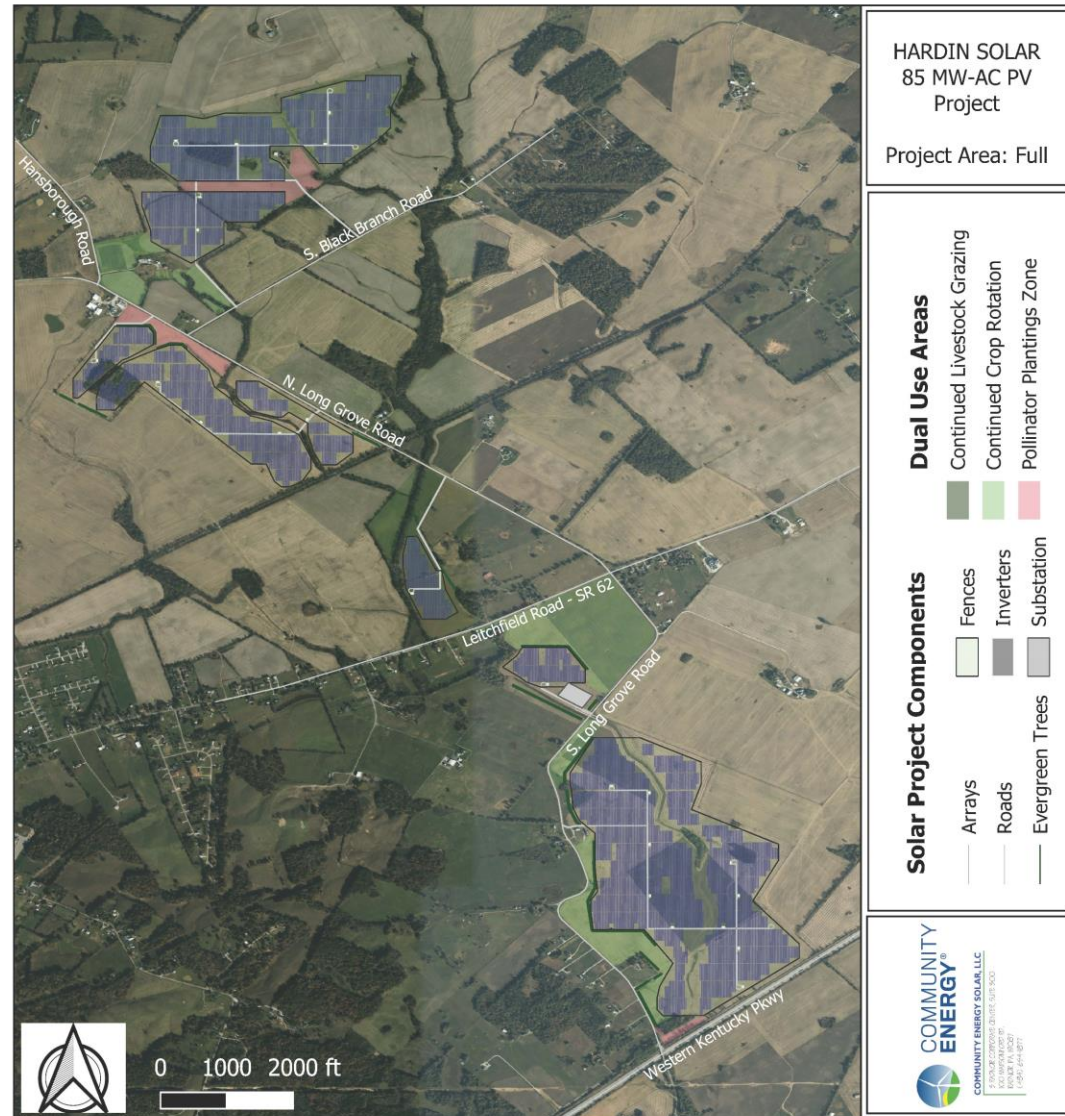


Project Layout

The solar panels will be set back from public roads by at least 100 feet and from neighboring residences by at least 500 feet.

From our experience a 500-foot setback allows the arrays to be a respectful distance from any home while still allowing us to efficiently use the field.

The project fenced area encompasses approximately 650 acres. Representing approximately 0.1% of the 403,000 total acres in Hardin County and 0.5% of farmland within the county.



Project Layout

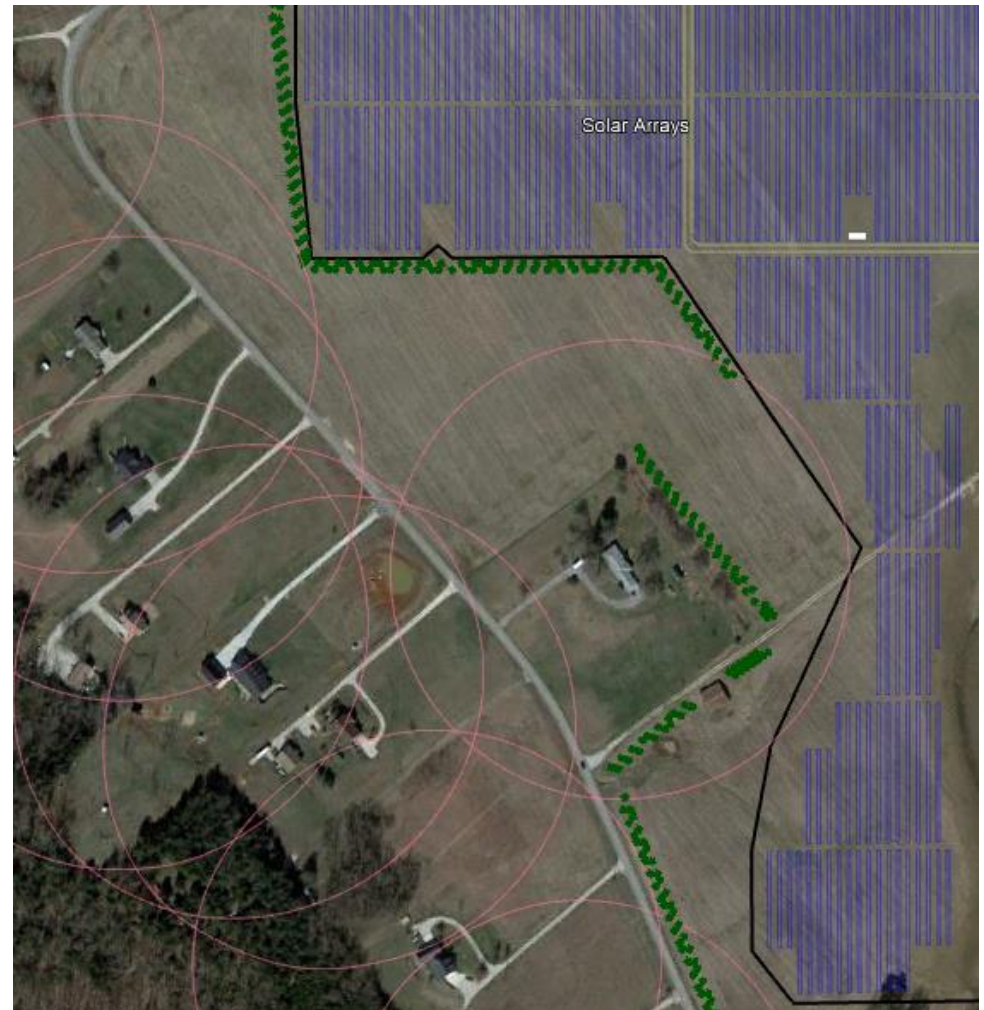
S. Long Grove Road Section 1 of 3

This close-up of the S. Long Grove Road section of the solar farm illustrates the setbacks from neighboring houses.

The pink circles have a radius of 500 feet.

Where existing natural vegetation doesn't exist between the solar farm and neighboring houses, a vegetative screen will be planted.

We have been working with project neighbors on the landscaping plans since May of 2021.



Project Layout

S. Long Grove Road Section 2 of 3

This close-up of the S. Long Grove Road section of the solar farm illustrates the setbacks from neighboring houses.

The pink circles have a radius of 500 feet.

Where existing natural vegetation doesn't exist between the solar project and neighboring houses, a vegetative screen will be planted.

The gray box displayed below represents the project substation, which will be screened from direct neighbors and the roadway.



Project Layout

S. Long Grove Road Section 3 of 3

This close-up of the S. Long Grove Road section of the solar farm illustrates the setbacks from neighboring houses.

The pink circles have a radius of 500 feet.

Where existing natural vegetation doesn't exist between the solar farm and neighboring houses, a vegetative screen will be planted.

The gray box displayed below represents the project substation, which will be screened from direct neighbors and the roadway.



Project Layout - N. Long Grove Road Section 2 of 2



This close-up of the N. Long Grove Road section of the solar farm illustrates the setbacks from neighboring houses.

The pink circles have a radius of 500 feet.

Where existing natural vegetation doesn't exist between the solar farm and neighboring houses, a double offset row of evergreens will be planted.



Project Layout - N. Long Grove Road Section 2 of 2



This close-up of the N. Long Grove Road section of the solar farm illustrates the setbacks from neighboring houses.

The pink circles have a radius of 500 feet. Where existing natural vegetation doesn't exist between the solar farm and neighboring houses, a double offset row of evergreens will be planted.



Project Visual Rendering

S. Long Grove Road Section View 1



Photo 1D
LANDSCAPE MITIGATION - 5 Year Simulated Growth and Crop Rotation

SARATOGA
ASSOCIATES

Photograph Information			
Date:	July 11, 2021	Photo Location:	37° 36' 21.3444" N,
Time:	Mid Afternoon		85° 58' 53.0184" W
Focal Length:	18 mm (27mm equivalent)	Distance to Fence:	210 Feet
Camera:	Nikon D3500D		

Figure 7
PHOTO SIMULATIONS
Hardin Solar Farm
Glendale, KY 42740

Project Visual Rendering

S. Long Grove Road Section – Example View 2



Photo 3D
LANDSCAPE MITIGATION - 5 Year Simulated Growth

SARATOGA
ASSOCIATES

Photograph Information			
Date:	July 11, 2021	Photo Location:	37° 36' 34.6752" N,
Time:	Mid Afternoon		85° 59' 04.8336" W
Focal Length:	18 mm (27mm equivalent)	Distance to Fence:	235 Feet
Camera:	Nikon D35000		

Figure 15
PHOTO SIMULATIONS
Hardin Solar Farm
Glendale, KY 42740

Studies

Interconnection Studies

The solar project will connect to an East Kentucky Power Cooperative transmission line which is part of a regional transmission network managed by the 'PJM Interconnection' (PJM).

PJM has been in the process of studying the proposed facility, to determine whether the existing transmission lines in the area can absorb this additional power, or if they need to be upgraded.

Any required upgrades will be paid for by the project.



Environmental Studies

Multiple environmental studies have already been conducted via third party environmental consultants and engineers. By identifying these resources at the front end, we can design our solar project in a way that avoids and minimizes any impacts to sensitive features on the site.

Conclusions:

- Wetlands and streams eligible for protection have been identified. Designed setbacks will assure protection.
- Floodplains eligible for protection have been identified. Designed setbacks will assure protection.
- Cultural resources recommended for protection have been identified. Designed setbacks and avoidance will assure protection and minimal impact.



Comprehensive Environmental Studies

Conclusions (continued):

- Threatened and endangered (T&E) wildlife habitat has been assessed. No T&E species were identified.
- A sandhill crane impact assessment has been completed. Due to the minimal impacts to foraging habitat, WEST concludes that the proposed Hardin Solar Project will not have a significant impact on the greater sandhill crane population in the study area.
- Karst features have been identified. Designed setbacks will assure protection.
- Design level geotechnical analysis have been completed to ensure design.
- Additional permitting studies include the following: Cumulative environmental assessment, Traffic and rail study, Economic impact study, Property value study, Visual impacts assessment and visual renderings, Professional landscaping plan



Kirkland
Appraisals, LLC



BACON | FARMER | WORKMAN
ENGINEERING & TESTING, INC.

Terracon
Consulting Engineers & Scientists



SARATOGA
ASSOCIATES

Landscape Architects, Architects,
Engineers, and Planners, P.C.

UK Gatton College of
Business and Economics

Acoustical Analysis

An 'Acoustical Analysis' has been conducted to determine whether the proposed solar farm will likely increase noise levels in the area.

The study concluded that the enhanced setback distances between the solar farm and neighboring residences are anticipated to diminish sounds from the solar farm to a level below 40 decibels – lower than the existing daytime noise level in the area.

Table 1. Sound Levels of Common Activities/Situations.

Activity/Event	dBA
Lowest audible sound to person with average hearing	0
Quiet rural, nighttime	25
Crickets, distant frogs	30
Birds, distant dog bark	40
Quiet urban, nighttime	45
Large business office	60
Normal speech at 3 feet	60-70
Noisy urban area, daytime	75
Food blender at 3 feet	85
Gas lawn mower at 3 feet	100
Jet flyover at 1,000 feet	110

Glare Analysis

A 'Glare Analysis' has been conducted to determine whether the proposed solar farm will result in glint or glare.

The study concluded that no glint or glare will result from the facility at any nearby residences or roadways.

The Federal Aviation Administration (FAA) and Kentucky Airport Zoning Commission have approved that the proposed project causes no glare or hazard to air traffic.



Permits

County Permitting

Solar is an allowed use in Hardin County through the Conditional Use Permitting process.

During the development stage, the project will seek a Zone Change, Conditional Use Permit and Development Plan approval from the Hardin County Planning Commission.



Hardin County
Planning and Development Commission

For more information, contact:

Adam King
Planning and Zoning Administrator

acking@hcky.org

(270) 769-5479

State Permitting

Hardin Solar will be seeking a **Construction Certificate** from the Kentucky Public Service Commission

The Construction Certificate will be issued by the Kentucky State Board on Electric Generation and Transmission Siting (the “**Siting Board**”).

The Siting Board review focuses on three areas:

- Environmental matters such as noise and visual impacts
- Economic impacts
- Impact of the proposed facility on Kentucky’s electric transmission grid

The Siting Board review takes approximately nine (9) months



Kentucky Public Service Commission



Commonwealth of Kentucky
**Kentucky State Board on
Electric Generation and
Transmission Siting**

For more information on the Siting Board:

<https://psc.ky.gov/Home/EGTSB>

To see Public Service Commission filings
related to this project:

<https://psc.ky.gov/Case/ViewCaseFilings/2021-00312>
Case No. [2021-00312](https://psc.ky.gov/Case/ViewCaseFilings/2021-00312)

Construction and Operations

Project Construction

If the Construction Certificate is approved:
Construction will start in 2024.

Construction period will be 6-9 months

Approximately 205 construction jobs

Hiring of local trades

- Electric
- Surveying
- Earthmoving
- Fencing
- Landscaping



Example of post installation during construction of Keystone Solar, PA

Solar projects are constructed the following general steps (1) posts are driven into the ground 7'-10' feet, (2) the racking system is bolted to the posts, (3) the solar panels are attached to the racks (4) the solar project inverters, transformers and electrical is installed and (5) the field is reseeded to ensure a healthy ground cover

Operations and Maintenance



Typical operations and maintenance duties include:

- Preventive Maintenance
- Repair
- Low-Impact Seasonal Vegetation Maintenance

Hardin Solar will require 2-3 full-time employees for operations and maintenance.

Continued Crop Rotation & Grazing

Four of the six participating parcels will continue an active crop rotation or livestock grazing on the property during the life of the solar project.



Solar Project Decommissioning

Restore for Future Farming



- Remove all above-ground and below ground equipment including complete removal of posts
- Restore land to farmable conditions
- Financial surety by project company, determined by independent engineer and provided to satisfaction of local municipality.
- Decommissioning cost estimate updated every 5 years by licensed KY professional engineer
- Return the land to farming at the end of the project

No Local Infrastructure Burden

- No need for water or sewer
- No burden on schools
- No additional police/EMS/other services
- No new roads for Town/County to maintain



Community Benefits



Solar farms do more than generate clean, low-cost electricity. They also generate economic growth. The Hardin Solar project will impact the local economy in multiple ways:

- **Construction Jobs** for local workers: 200+ jobs during the 6–9-month construction of the project
- **Construction Contracts** for local businesses: Electrical, Site Work, Landscape, etc.
- **Local Spending** during construction: Hotels, Restaurants, Shops, Entertainment, etc.
- **Long-term Tax Revenue:** The solar farm will pay substantial taxes over 30 years, without increased pressure on community services such as roads, schools, libraries, and first responders.
- **Full-Time Jobs:** 2-3 full-time operations and maintenance jobs



Summary

In a single hour, the amount of solar power that strikes the Earth is more than the entire world consumes in a year.

Hardin Solar proposes to capture some of that solar power, convert it to usable electricity, and deliver it to the local community at a competitive price.

We seek to develop a solar project that is respectful of our neighbors and delivers multiple benefits to the greater Hardin County community.

We invite your questions, comments, and feedback.



Question & Answer Session

For more information, or to receive a printed version of this presentation:

Email us at hardinsolar@communityenergyinc.com

or call us at (877) 321-0465

Thank You