



**SOLAR ENERGY**  
Solutions

NOVEMBER 4, 2022

# Proposal

for: Frankfort Plant Board

## Community Solar PV System Design and Construction

Frankfort Plant Board  
121 Flynn Ave.  
Frankfort, KY 40601



**Frankfort Plant Board**



Solar Energy Solutions (SES) is the region's largest and most experienced solar design, engineering, and construction company with projects in Indiana, Kentucky, Ohio, and the surrounding states. SES is also the region's leading Tesla Powerwall Certified Installer. Founded in Kentucky in 2006, Solar Energy Solutions has more than 3,000 active photovoltaic and battery storage projects in the residential, commercial and utility arenas throughout the tri-state region and beyond.



## Cover Letter

Thank you for considering Solar Energy Solutions, LLC (SES). We would be pleased to work with you in the development of the photovoltaic system for the referenced solicitation. Solar Energy Solutions, LLC is dedicated to bringing renewable energy to Kentucky, Indiana and the surrounding states, helping the environment, establishing energy independence, and educating the public on how to take part in making a healthier, more secure future.

### Regional Leader in Solar Energy Development

As a solar integration company, SES has experience installing all types of solar equipment. Founded in early 2006, SES is the region's preeminent full-time renewable energy design, engineering and installation firm, installing megawatts of rooftop and ground-mounted solar every year. The SES staff are specifically trained and solely engaged in the development of solar photovoltaic and battery storage systems, carrying all relevant licenses and certifications including a PE license, electrical licenses and solar-specific North American Board of Certified Energy Practitioners (NABCEP) certifications. SES merges engineering expertise with electrical acumen to produce superior renewable energy installations. SES has completed numerous exceptional projects across the governmental, institutional, and commercial projects, including one of the largest rooftop installations in the region at 5MW in size. Some of our notable government and municipal projects include the KY National Guard, Bloomington City Hall and Police Department, as well as Valparaiso City and Public Utility (currently in progress)

### Exceptional Qualifications

The design/build team formed for the solar installation at Frankfort Plant Board in Frankfort, KY holds numerous professional certifications, listed below, that are reflected in the quality of their work.

*Erik Meyerhoffer*

Commercial Sales Project Manager  
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## Executive Summary & Price Proposal

Solar Energy Solutions (SES) will provide a grid-tied 186.84 (MW) DC solar array producing 228,300 kWh/yr at the Frankfort Plant Board facility. The array will utilize Boviet 540-watt modules mounted with South orientation on RBI Solar Ground-mount structure (or approved equivalent) installed by SES. Quality design and components will provide the least cost-per-kilowatt-hour in the near and long-term while complying with National Electric Code (NEC), utility/regulatory codes, and solar industry best-practices. SES will further provide additional design and cumulative site work (including fencing) for future phases of the project.

SES will install CPS inverters and provide a CPS Flex Gateway and revenue grade meter for remote monitoring/error notification of the system as well as visibility into wind speed and irradiance data. SES will provide a plan and execute for all necessary vegetation clearing and erosion control relevant to site conditions. We will further provide facilitation of any maintenance/replacement necessary for all equipment under their respective Manufacturer Warranties. SES installation includes a two-year full system workmanship warranty

Base price includes:

- Design of the entire Community Solar Site (4 Phases, 600kW-AC)
- Site work for the entire site (phases 1-4), vegetation removal and fencing
- The initial phase construction (150kW-AC)

## Technical Solution

### Scope

SES proposes to install 346 Boviet 540-watt Bifacial or Monofacial solar modules on the designated Frankfort Plant Board site at 151 Flynn Avenue 40601. As requested, a gravel access road will be provided off of Sower Blvd, entering the southwestern boundary of the fenced array area.

A 200-amp and 100-amp 600-volt fused disconnect will be mounted adjacent to the identified Point of Interconnect and Frankfort Plant Board-provided 480-volt Wye transformer. SES will rough-in all conduits and secondary wiring to the transformer per FPB specifications and complete all conduits and wiring from the transformer secondary through the entirety of the array.

Underground PVC conduit and wiring will feed from the disconnects to the three CPS 50kW 480V Inverters mounted at the array. This underground duct bank will utilize rigid PVC conduit and aluminum conductors. Communications wiring will daisy-chain between inverters and to the CPS Flex Gateway for network connection. The inverter selection will provide a 1.25 DC/AC ratio with 0.1% annual clipping.

From each inverter, 1,000-volt PV wiring will run along the array structure to individual module strings. Wiring will be supported at appropriate intervals by UL-listed components and per industry standards. Jumpers, splices, and other potential failure points will be all but eliminated by commonsense design.

RBI Solar racking has been chosen due to its ability to provide adequate support in high-slope areas, such as those present at this site. The solar racking structure, as designed, will incorporate solar modules two-high in portrait orientation at 30-degree tilt and facing due south. Piles will be driven in soil to support the structure, per RBI Solar engineering.



## Technical Solution continued

### Design Assumptions and Considerations

Installation will be performed by full-time SES employees with direct oversight by SES project manager and team leader; both with prior responsibility for multiple million-dollar projects. Subcontracting of discrete tasks like fencing, road creation, and landscaping may occur. SES will work in partnership with key vendors on implementation of racking system, including likely subcontracting of mechanical assembly. SES NABCEP-certified installers and licensed electricians will be present for the duration of the installation and through commissioning.

Our design incorporates six-foot galvanized steel fence with three strands of barbed wire. Fencing assumes a 20' setback from solar array and one manual double access gate.

SES will seed native grasses under the array, meant to minimize future ground cover maintenance.

SES will coordinate with a local Civil Excavation company to provide necessary tree and vegetation clearing (pictured below) as well as to implement the appropriate water management and erosion control plan.





## Production Guarantee

- The first phase of the project will have a power capacity of 186.84kW (DC) and 150kW (AC). This system is estimated to produce 228,300 kWh annually. The two-year rolling, weather-adjusted, 90% guarantee of the P50 is 205,470 kWh.
- The second phase of the project will have a guaranteed power capacity of 373.68kW and 300kW (AC), estimated to produce 455,500 kWh annually. The two-year rolling, weather-adjusted, 90% guarantee of the P50 is 409,950 kWh.
- The project encapsulating the entire Community Solar Site will have a guaranteed power capacity of 747.36kW (DC) and 600kW (AC), estimated to produce 906,300 kWh annually. The two-year rolling, weather-adjusted, 90% guarantee of the P50 is 815,670 kWh.
- Visual layouts for the respective phases of the project are illustrated below. Full technical sheets for these designs can be found in Attachment A.

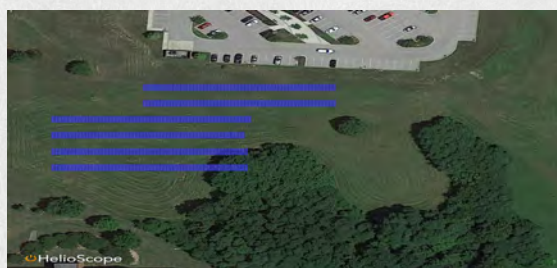
Phase 1:



Phase 2:



Phase 3:





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## Project Staff/Organizational Structure

Below are the profiles, including the qualifications of Solar Energy Solutions' management team and the management staff that will oversee the project.

**Frances Lockwood**, PhD., P.E., is the President and majority partner of Solar Energy Solutions. Dr. Lockwood is a chemical engineer with 30 years' experience in management of R&D, planning and project management. In 2006 she founded Solar Energy Solutions, a woman-owned small business that is currently the leading installer of solar projects in Kentucky. Dr. Lockwood takes primary responsibility for bid preparation and project oversight. She is responsible for forming bid teams with sub-contractors and for the SES safety program. She maintains financing for SES, chairs monthly meetings, and convenes meetings of the SES Advisory Board. Dr. Lockwood has twice been elected as Vice-Chairman of the Kentucky Solar Energy Society.

**Matthew Partymiller**, NABCEP, CE, is the General Manager (Operations) of Solar Energy Solutions. Mr. Partymiller has led the development of SES since its inception in 2006. He is primarily focused on project implementation and design.

Mr. Partymiller is directly responsible for implementing the plans of the company president and informing her of ongoing activities which may not otherwise require her attention. Since the inception of SES, Mr. Partymiller has installed renewable projects in all four corners of Kentucky and expanded SES into surrounding states. Mr. Partymiller has led the company in the design and installation of more than 3000 projects, including installations of photovoltaic, solar thermal, wind renewable energy, battery storage. Mr. Partymiller was involved as a co-founder of Kentucky's Solar Energy Society where he has served on the board. Mr. Partymiller was the first NABCEP dual certified Kentuckian for PV and solar thermal and one of the first 25 dual certified installers in North America.

**Jeffrey Nazarko**, VP of Sales, Marketing & Business Development. Mr. Nazarko is responsible for the oversight and management of all sales and marketing processes at Solar Energy Solutions. Mr. Nazarko started his career in the power conversion business working to develop and market the first generation of grid-tied energy storage system and renewable integration. After that, Mr. Nazarko worked for a world class manufacturer of highly engineered, precision electrical steel products used in energy conversion systems. As Global Marketing Director he collaborated with clients to develop innovative technologies for commercial, industrial, and electric propulsion systems with a focus on efficiency improvements to reduce energy consumption.