

# Franklin County Cooperative Extension Service

## Solar PV and Battery Storage Project

May 7, 2024

### Proposals Due May 15, 2024, 4:00pm EST

Please submit proposals via email to Joshua Alcorn (FCES) and Andy McDonald (Apogee) at:

#### Extension Office Contact:

Joshua Alcorn, Facilities Manager, FCES  
101 Lakeview Court, Frankfort, KY 40601  
502-695-9035 Email: [Joshua.Alcorn@uky.edu](mailto:Joshua.Alcorn@uky.edu)

For information on previous solar assessment from Apogee-Climate & Energy Transitions:

Andy McDonald, Director, Apogee – Climate & Energy Transitions  
316 Wapping St., Rm. 208, Frankfort, KY 40601  
502-682-9920 (cell) [andyboeke@yahoo.com](mailto:andyboeke@yahoo.com)

#### Introduction

The Franklin County Cooperative Extension Service (FCES) is seeking proposals for a solar photovoltaic system to meet up to 100% of their office electricity needs, with a battery storage option. A solar site assessment and utility bill analysis has been provided to FCES by Andy McDonald of Apogee-Climate & Energy Transitions. Based on Apogee's analysis, we have a preliminary estimate of the size solar PV system required for the FCES facility, 59 KW-dc or 45 KW-ac. Based on electricity usage in 2022, a 59.15 KW-dc PV array would generate 82% of FCES' annual usage. A system of this size would be the maximum permissible under Kentucky Utilities' NMS-2 net metering tariff (45 KW-ac).

## Site Information:

**Location:** 101 Lakeview Court, Frankfort, KY 40601

**Roof:** Asphalt Shingle, installed 2023. Building is two story including a walk-out basement.

**Electric Utility:** Kentucky Utilities. Rate schedule: General Service Three Phase

### Electric Charges

Basic Service Charge	\$2.15 per day	
Energy Charge (\$/kWh)		0.11869
Electric DSM (\$/kWh)		0.00152
Fuel Adjustment (\$/kWh)		0.00176
<b>Total kWh charge (\$/kWh)</b>		<b>0.12197</b>

Demand Charge: none. Net Metering policy: allowed up to 45 KW-ac on tariff NMS-2

### Franklin County Cooperative Extension Office

#### Electricity Usage (kWh) 2018, 2022, 2023

	2018	2022	2023
-			
January	9,796	5,800	6,800
February*	8,924	5,320 *	5,680
March	8,016	4,840	6,800
April	7,600	5,520	5,320
May	9,601	5,480	6,840
June	14,356	9,680	12,200
July	13,348	12,360	11,520
August	12,657	11,160	11,520
September	12,952	10,680	7,680
October	7,478	7,080	6,040
November	6,232	8,280	4,880
December	7,479	7,600	4,000
<b>Annual Total</b>	<b>118,437</b>	<b>93,800</b>	<b>89,280</b>

\*February 2022 usage data was missing so average of January and March used.

## Preliminary Solar Assessment

Apogee prepared a solar site assessment report using SolarEdge Designer software (see attached report). REC 350 Watt modules and SolarEdge inverters were used for modelling purposes but other manufacturers' equipment may be specified for this project.

PV Array: 59.15 kW-dc

Inverter: 44.2 kW-ac

Annual Energy Production: 76,730 kWh

Solar Offset of 2022 Usage: 82%

## Solar PV System Requirements:

General system:

1. All systems shall be code-compliant to NEC 2017 (Kentucky).
2. Kentucky NEC 2017 compliant systems must fully incorporate 690.1 rapid disconnect requirements (as legally mandated).
3. Central inverters shall be transformerless.
4. Electrical connection shall be on the load side of the meter.
5. Metal conduit shall be used for all above ground wiring. Rigid metal conduit is preferred.
6. Surface mounted metal conduit is acceptable, except in finished interior areas.
7. Only copper wire shall be used.
8. Designs shall comply with local code requirements including access space around the array and conduit surface support requirements.
9. Grid connection shall follow the utility company's design and installation standards.
10. Performance monitoring shall be provided at array or module level and installers will provide appropriate written and verbal guidance to ensure customer can access web or App-based monitoring and fault data.

PV modules shall:

1. Be listed and reviewed on the California Energy Commission list entitled, [\*'Incentive Eligible Photovoltaic Modules in Compliance with SB1 Guidelines'\*](#).
2. Have at least a 25-year power warranty with a specified performance degradation curve showing a minimum of 80% of the nameplate rated power at STC by year 25.
3. Have a product warranty of at least 25 years.
4. Independent of the mounting systems, panels must be rated for snow and wind load in accordance with local permitting requirements.
5. Panels must have efficiencies of no less than 20% at Standard Test Conditions.

Inverters shall:

1. Be included in the California Energy Commission list entitled '[List of Eligible Inverters per SB1 Guidelines](#)'.
2. Have a warranty that allows for replacement due to premature failure over the specified warranty time frame and consist of a minimum of 15-year material warranty for micro inverters and 10 years for string inverters. Longer warranties will be viewed favorably.

Mounting Equipment shall:

1. Be grounded in accordance with manufacturer's specifications.
2. Be used in accordance with its manufacturer's listed purpose and specifications.
3. Be used in accordance with manufacturer specifications for waterproofing penetrations.
4. Be installed in accordance with specific local zoning requirements beyond #2 and #3.
5. Be fitted with manufactured flashing systems for roof penetrations and shall be installed in accordance with manufacturer's and NABCEP recommendations.
6. Provide minimum 25 year manufacturer's warranty.

#### **Battery Storage Option:**

1. Batteries must meet all applicable standards in the NEC 2017, IEEE, NABCEP, and from local utilities for technology, safety, and grid interoperability.
2. Battery storage option shall be designed to serve critical loads of facility. Proposals shall identify:
  - a. KW and KWH capacities of battery
  - b. Maximum amperage of continuous loads served by batteries
  - c. Maximum surge current of batteries
3. Proposals shall include all associated electrical equipment required including panel upgrades or additional critical load panels, if needed.
4. Include minimum 10 year manufacturer's warranty.

#### **System Warranty**

Total system warranty minimum 7 years shall cover entire installation and roof penetrations.

#### **Proposal Format**

Proposals shall include:

1. Total system cost, including all equipment, labor, engineering, design, permitting, and interconnection costs.
2. Separate pricing for options with and without batteries.
3. Identify make and model for major equipment (PV modules, inverter, racking, batteries).
4. Expected timeframe for installation after contract signing.
5. Qualifications and experience of the Company and all key project personnel.

**Attachments:** SolarEdge Designer Report for FCES Office