

**ELECTRONIC BID NOTICE TO PROPOSERS
INSTALLATION OF NEW OFF-GRID SOLAR AND
BATTERY SYSTEM ON
S.B.872
STATE GAME LANDS NO. 203
MARSHALL TOWNSHIP, ALLEGHENY COUNTY**

Pennsylvania Game Commission (PGC)

2001 Elmerton Avenue

Harrisburg, PA 17110-9797

DATES

Bid Opening: **Thursday, December 11, 2025**

Developer Selection: **Wednesday, December 17, 2025**

Validity Begin Date: **December 2025**

Validity End Date: **June 30, 2026 (complete project)**

Site Visit (In Person): **Not mandatory. See arrangement instructions on page 5 if you would like to visit the site.**

Table of Contents

1.	INTRODUCTION.....	4
2.	GENERAL INFORMATION & BID INSTRUCTIONS	5
2.1	KEY DATES.....	5
2.3	BID SUBMISSION INSTRUCTIONS	5
2.4	BID DEADLINE.....	6
2.5	CONFIDENTIALITY.....	6
2.6	PERFORMANCE BOND.....	6
2.7	COMPLIANCE WITH LAWS AND REGULATIONS.....	6
2.8	QUESTIONS.....	6
3.	PV SYSTEM STANDARDS AND REQUIREMENTS	7
3.1	APPLICABLE PERMITTING	7
3.2	DESCRIPTION OF BUILDING AND GROUNDS.....	7
3.3	USAGE - SYSTEM SIZING	11
3.4	SYSTEMS DESIGN	13
3.5	PREVAILING WAGE REQUIREMENT	14
4.	BID REQUIREMENTS	15
4.1	BIDDER INFORMATION	15
4.2	SOLAR PROJECT DEVELOPMENT EXPERIENCE.....	16
4.3	SOLAR AND STORAGE SYSTEM HARDWARE.....	16
4.4	SYSTEM DESIGN	16
4.5	SYSTEM PERFORMANCE.....	17
4.6	PROPOSED PRICING.	17
4.7	SUMMARY SPREADSHEET.....	18
4.8	BID SIGNATURE.	18
5.	SELECTION CRITERIA.....	18
	Appendix A: System Reference Design Assumptions	20

Figures

<i>Figure 1: Google image of the location of the building</i>	7
<i>Figure 2: Google image of the roof of the building</i>	8
<i>Figure 3: Photograph of front of building</i>	8
<i>Figure 4: Photograph of back of building</i>	9
<i>Figure 5: Closer photograph of back of building and roof</i>	9
<i>Figure 6: Photograph of interior of building (1 of 2)</i>	10
<i>Figure 7: Photograph of interior of building (2 of 2)</i>	11
<i>Figure 8: EnergyGuide label for Electrolux chest freezer</i>	12
<i>Figure 9: Helioscope (1 of 3)</i>	21
<i>Figure 10: Helioscope (2 of 3)</i>	22
<i>Figure 11: Helioscope (3 of 3)</i>	23
<i>Figure 12: IronRidge Racking Report (1 of 2)</i>	24
<i>Figure 13: IronRidge Racking Report (2 of 2)</i>	25

Tables

<i>Table 1: Sample appliance peak load assumptions for off-grid electricity usage</i>	11
<i>Table 2: System Component Assumptions</i>	22

1. INTRODUCTION

The Pennsylvania Game Commission (PGC) invites bids from solar energy developers (each a “**Bidder**”) to design and construct a completely off-grid roof-mounted solar photovoltaic system on a Pennsylvania Game Commission-owned property identified herein (the “**System**”). Bids will be opened electronically in the PGC Division of Contracts and Procurement, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797, on Thursday, December 11, 2025, at 2:00 PM.

The solar goals of the Pennsylvania Game Commission are largely as follows:

- Encourage more use of a Pennsylvania Game Commission building by providing it with an economical and sustainable solar energy and storage system
- Serve as a model for maximizing use of a Pennsylvania Game Commission resource where locations are cost prohibitive for connecting electricity to the grid.
- Power its facilities through renewable, clean energy in support of their missions of sustainability
- Share the sustainability efforts, including solar - if achieved, with their communities, staff, and the greater public to demonstrate leadership in sustainability

The description of this project is as follows: The design and installation of a completely-off-grid energy system for a S.B. 872, SGL 203, in Wexford, PA. The system should include an approximately 7-kW roof mounted photovoltaic solar array on the roof and a Lithium Ion battery (LiFEPO4) that supports 9 kilowatt-hours per day to support a welder, freezer, compressor, and lights. System must allow for fully off-grid energy system that produces approximately 7,507 kWh/year.

The PGC is interested in receiving bids for a direct ownership model, where the PGC will own the system from its construction. The Bidder must have at least one employee that is a certified North American Board of Certified Energy Practitioners (NABCEP) PV installer.

All System related equipment must be Nationally Recognized Testing Laboratory (NRTL), such as UL or ETL listed for its designed use. Construction must comply with current adopted State Building Code at the time of permitting, which currently includes: International Building Code (IBC 2018), National Electric Code (NEC 2017 or later, under National Fire Protection Association or NFPA 70 Standards, and State Fire Marshall (if applicable).

Bidders (and/or their subcontractors and partners) to this bid shall have demonstrated experience designing, planning, permitting, constructing, maintaining and financing solar electric systems; have the ability and financial resources to construct and maintain the System; provide system monitoring and maintenance; have established onsite safety standards and possess appropriate levels of liability insurance and workmen’s compensation. Other requirements are detailed in this document.

2. GENERAL INFORMATION & BID INSTRUCTIONS

2.1 KEY DATES

Date	Action
Monday, December 8, 2025 at 5:00 PM EST	Deadline for requesting site visit
Monday, December 8, 2025 at 5:00 PM EST	Deadline for submitting email questions
Monday, December 11, 2025 at 2:00 PM EST	Bids due
Monday, December 11, 2025	Expected date of Award Announcement

2.2 SITE VISIT

A site visit is not mandatory.

Please contact Ms. Angela Lindgren at 717-787-4250 ext. 73620 or Mr. Daniel Puhala at 724-244-7113 if you plan to arrange a site visit. For the site visit, meet at the location shown in Figure 1 for a walkthrough of the system site.

2.3 BID SUBMISSION INSTRUCTIONS

Mandatory Bid Contents. Bidders must follow the bid contents as listed in Section 4 BID REQUIREMENTS below). Bids that do not provide all of this content will be rejected.

Mandatory Bid Format. Bidders must submit their bids in the following format:

An electronic version of the complete bid as both a PDF and as an Excel file depending on which was used to generate the file.

Bid Delivery. All bids must be submitted electronically using the SRM system. All vendors who conduct business with the Pennsylvania Game Commission must have a Vendor No. assigned to them to receive payment from the Commonwealth. Effective immediately, vendors may access the website www.pasupplierportal.state.pa.us or phone 877-435-7363 or 717-346-2676 or email RA-PSCSRMPORTAL@pa.gov for assistance to register as a new vendor or, if you are an existing vendor, to change a main or remit to address. This is a Department of General Services (DGS) website, so Bidders must contact DGS directly with any website concerns or issues. When bidding, amount bid should be in dollars and cents---- no fractions of a cent will be accepted.

The Commonwealth reserves the right to reject any and all bids, to waive technical defects in bids and to accept or reject any part of the bid deemed in the best interests of the Commonwealth. Except as otherwise provided by law, award will be made to the lowest responsible and responsive bidder. A Purchase Order will be generated at the time of award without further input from the successful bidder. Awarded vendor will be sent a copy of this document and no work will be authorized until the vendor is in receipt of the Purchase Order.

2.4 BID DEADLINE

Bids must be received by:

Thursday, December 11, 2025 at 2:00 PM.

The costs incurred by Bidders in developing its bid are their sole responsibility, and the Pennsylvania Game Commission shall have no liability for such cost. Any bid submitted shall become the property of the Pennsylvania Game Commission and will not be returned to Bidders.

An authorized person representing the legal entity of the Bidder must sign the Bid.

2.5 CONFIDENTIALITY.

All or portions of bids submitted in response to this request for bid documents may be disclosed to the public after a contract is awarded or after the opening and rejection of all bids. Therefore, in submitting your bid, please identify any portion of your bid which it is your position constitutes or reveals a trade secret or confidential proprietary information that is not subject to public disclosure under the Right to Know Law. As required by the Right to Know Law, you will be notified if the Pennsylvania Game Commission receives a request for access and/or copies of the bid documents.

2.6 PERFORMANCE BOND

The successful Bidder will be expected to provide a Performance Bond in the amount of 100% of the total contract price of the award prior to providing service, but in no event shall it be submitted more than ten (10) days after the award. The Performance Bond shall be issued by a surety company legally authorized to do business within the Commonwealth of Pennsylvania.

2.7 COMPLIANCE WITH LAWS AND REGULATIONS

By submitting a bid, the Bidder agrees to abide by all applicable local, state and federal regulations, ordinances and laws, including, but not limited to, OSHA laws and regulations, during the performance of the services contemplated by this bid. The Bidder certifies, for itself and its employees, that it shall comply with the laws, rules, regulations and policies of all federal, state and local governments and agencies of applicable jurisdiction in the performance of the services contemplated by this bid.

2.8 QUESTIONS

Any questions concerning the process and procedures applicable to this bid, are to be submitted in writing by e-mail only to Angela Lindgren at alindgren@pa.gov or Daniel Puhala at dpuhala@pa.gov.

Other than emails to Ms. Lindgren or Mr. Puhala, Bidders are prohibited from contacting any Pennsylvania Game Commission employee, officer or official concerning this bid. A Bidder's failure to comply with this requirement may result in disqualification. No oral statements by any Pennsylvania Game Commission staff or representatives shall be effective to waive, change or

modify any of the provisions of this bid, and no Bidder shall rely on any alleged oral statement regarding this bid.

3. PV SYSTEM STANDARDS AND REQUIREMENTS

3.1 APPLICABLE PERMITTING

The proposed solar project will be located in Marshall Township. The zoning office's website is <https://www.twp.marshall.pa.us/156/Zoning>.

The selected developer will be responsible for securing all needed permits and complying with all applicable zoning requirements.

An L&I building permit for this work has been secured by the PGC and will be provided to the winning bidder. The contractor is responsible for all required L&I inspections.

3.2 DESCRIPTION OF BUILDING AND GROUNDS

The Pennsylvania Game Commission location where the System will be located at State Gamelands Rd, Wexford, PA 15090. The GPS coordinates are: (40.620303082, -80.1173410823) (GMT -5.0).

Satellite images showing the location and the roof of the Pennsylvania Game Commission building[s] and the property are shown in Figure 1 and Figure 2 below.

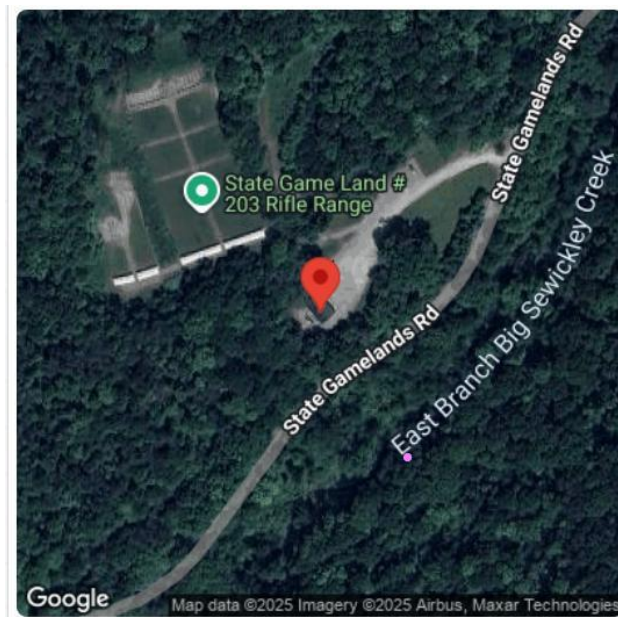


Figure 1: Google image of the location of the building



Figure 2: Google image of the roof of the building

Photographs of the exterior of the building are shown in Figures 3, 4, and 5.



Figure 3: Photograph of front of building



Figure 4: Photograph of back of building



Figure 5: Closer photograph of back of building and roof

Photographs of the interior of the building are shown in Figure 6 and Figure 7.



Figure 6: Photograph of interior of building (1 of 2)



Figure 7: Photograph of interior of building (2 of 2)

3.3 USAGE - SYSTEM SIZING

The Pennsylvania Game Commission plans to enable off-grid usage for a welder, a compressor, a freezer, and 5 LED lights. An off-grid usage chart is shown in Table 1 with approximations for usage. It should be assumed that all appliances (loads) can be used at the same time.

Table 1: Sample appliance peak load assumptions for off-grid electricity usage

Appliance Load Description	Quantity	Watts	Hours On Per Day	Watt-Hours per Day
Welder	1	1600	2	1600
Compressor	1	4500	2	9000
Refrigerator (22 cubic ft)	1	57	24	1368
Lights	5	40	12	480

An Electrolux Chest Freezer, Model FFCL2042AW with capacity of 19.8 Cubic Feet and an EnergyGuide Estimated Yearly Energy Use of 361 kWh is under consideration for purchase. The System shall support this model or equivalent at a minimum. The approximations in Table 1 allow for a slightly larger model of 22 cubic feet if desired. The Energyguide label is shown in Figure 8.

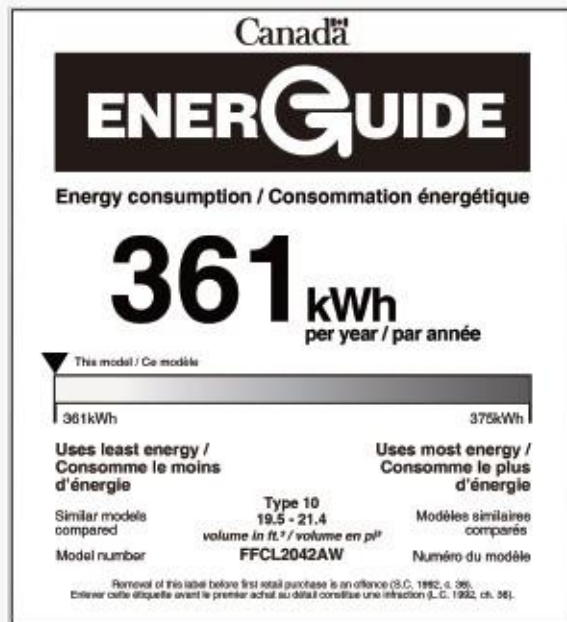
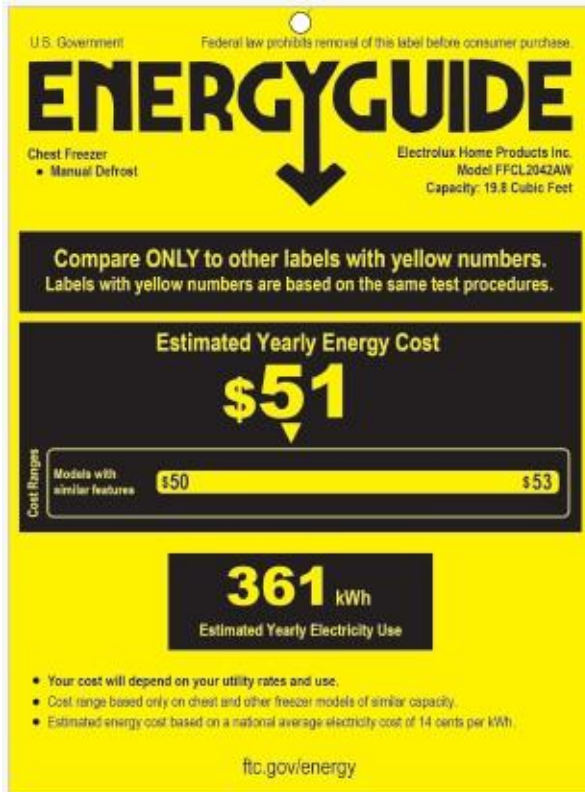


Figure 8: EnergyGuide label for Electrolux chest freezer

The System must allow for fully off-grid energy production approximately 7,507 kWh/year, and storage of energy storage that supports an average of approximately 9 kWh per day, taking into account the peak loads specified in Table 1.

3.4 SYSTEMS DESIGN

3.4.1 Equipment Standards

Bidders may select any components that they determine will satisfy system needs, so long as commercial off-the-shelf products are used. There is no requirement to use the specific components that are included as part of the example design in this bid package.

3.4.2 PV modules

PV modules shall be a commercial off-the-shelf product and shall be UL/ETL listed. System wiring, devices and equipment shall be installed in accordance with the provisions of the NEC 2017 or later.

3.4.3 Inverters

Inverters shall be commercial off-the-shelf products, listed to UL 1741 and IEEE 1547. There is no requirement to use the specific components that are included as part of the example design in this bid package.

Ideally, the inverter will have at a minimum the following features:

- UL/ETL listed
- Peak efficiency of 96% or higher
- Operational indicators of performance
- Built-in data acquisition

3.4.4 Racking

The mounting and racking system shall be designed in accordance with all applicable state and local codes and standards. Ideally, all structural components shall be non-corrosive (galvanized steel, stainless steel or aluminum) and shall be designed to obtain a minimum 40-year design life.

100% of any steel and iron in the racking system should be of U.S. origin if possible.

3.4.5 Batteries

Battery or batteries shall be commercial off-the-shelf products.

Battery or batteries shall use a Lithium Iron (LiFEPO₄) chemistry.

Battery or batteries shall support a minimum of 9 kilowatt-hours per day.

Bidders should specify the battery capacity (kWh), depth of discharge (DoD), charge and discharge rates of batteries.

3.4.6 Monitoring system

Bidders should specify the mechanisms for managing the entire System, including battery management and solar energy management. Data should be available both in real time and historical data from different times of the year for monitoring efficiency and availability.

All monitoring hardware and monitoring equipment shall be provided by the selected Bidder.

3.4.7 Interconnection and Site Plan

Interconnection with the local electric distribution system is not possible. However, all local, state, and federal regulations must be observed, and permitting is the responsibility of the Bidder.

Bidders shall provide a site-plan with their bid, which shows the location of the solar PV array, inverter(s), battery or batteries.

3.5 PREVAILING WAGE REQUIREMENT

The Bidder must ensure that it and all contractors and subcontractors engaged during the on-site construction, renovation, rehabilitation, reconstruction, demolition, alteration and repair work on any segment of work on the System will pay their workers not less than the prevailing minimum wage and benefit rates for all crafts or classifications, as determined by the Department of Labor and Industry under the act of August 15, 1961 (P.L.987, No.442), known as the Pennsylvania Prevailing Wage Act.

BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGES PROJECT RATES

Project Name:	SGL 203 Solar Panel Installation
General Description:	Installation of solar panels and battery system for state owned building.
Project Locality	Marshall Township
Awarding Agency:	PA Game Commission
Contract Award Date:	10/1/2025
Serial Number:	25-08686
Project Classification:	Building
Determination Date:	9/18/2025
Assigned Field Office:	Pittsburgh
Field Office Phone Number:	(412)565-5300
Toll Free Phone Number:	(877)504-8354
Project County:	Allegheny County

4. BID REQUIREMENTS

Bidders who wish to be selected by the Pennsylvania Game Commission for this Project must submit a bid organized by the following sections:

4.1 BIDDER INFORMATION

Provide the following information about the Bidder:

1. Bidder's Point of Contact and Business Address
2. Solar installer certifications (NABCEP, etc.) held by employees.
3. Licensing: Electrical and other contractor licenses held by employees.

In addition to providing the information listed above, the following information must be available upon request:

Exhibit 1.1. Resumes of business owners and managers.

Exhibit 1.2. Three (3) references. Provide the Name of the Project, Contact Name, Address, Telephone, email, and Services Performed (and Time Period).

Exhibit 1.3 Specification sheets for key equipment parts, for example solar modules, inverter, battery, monitoring, modem, rapid shutdown device, and racking.

4.2 SOLAR PROJECT DEVELOPMENT EXPERIENCE.

Provide the following information about the Bidder's solar project experience, including solar projects installed (kWDC) and solar projects that include storage installed (kWDC). In addition to providing the information listed above, the following information must be available upon request:

Exhibit 2.1. A list of at least 3 example projects (address, size, annual output and off-taker) that Bidder has installed in 2022, 2023, 2024 and 2025 to date, with customer contact information for each.

Exhibit 2.2 References and contact information for off-grid solar installation customers (if any)

Exhibit 2.3 Listing of subcontractors for the project, including company name, address, management, and services to be provided.

4.3 SOLAR AND STORAGE SYSTEM HARDWARE.

A set of assumptions is included in Appendix A: System Design Assumptions on page 22. Provide the following information:

1. Solar Modules (manufacturer and model #).
2. Solar Inverters (manufacturer and model #).
3. Roof Mounting Racking System (manufacturer, model #).
4. Rapid Shutdown Device (manufacturer, model #).
5. Battery (manufacturer, model #).
6. Balance of System (wiring, conduit, combiner boxes, miscellaneous).
7. System monitoring method (taking off-grid into consideration).

As exhibits to the Bid, provide the following:

Exhibit 3.1. Cut sheets for the modules, inverters, racking system, and batteries.

4.4 SYSTEM DESIGN

Discuss the proposed system design, addressing:

- Recommended System Size (kW_{DC} and kW_{AC}).
- Recommended System Location(s). The location of the modules, inverters, and batteries.

- The dimensions of the System and estimated area required.
- The azimuth and tilt of the modules (or specify one or two-axis trackers).

As an exhibit to the Bid, provide the following:

Exhibit 4.1. Electrical and site-plan drawings showing the system design and layout.

4.5 SYSTEM PERFORMANCE.

Provide System generation estimates based on the proposed System hardware and the proposed System design:

- Year One System Output (kWh) by month and for Year 1.
- Annual PV output de-rate factor.
- System Performance Guarantee. Specify the percentage of system output stated in 4.5.1 that will be guaranteed for Year One and the financial terms that will apply if the system output falls short of the guaranteed Year One performance.

As an exhibit to the Bid, provide the following:

Exhibit 5.1. Copies of PV modeling software generation report, if any.

Exhibit 5.2 Copies of battery modeling software generation report, if any.

Exhibit 5.3. Copy of the proposed System Performance Guarantee.

4.6 PROPOSED PRICING.

4.6.1 Project Construction Budget.

See Construction Bid Form.

4.6.2 Proposed Project Schedule and Payment Terms.

Provide a **Proposed Project Schedule** for the project that includes the major project milestones listed below.

- Contract Execution
- Final project design / Permits filed
- Equipment Ordered
- Notice to Proceed with Construction
- Mechanical completion
- System Commissioning
- Permission to Operate / Placed in Service

Payment is as per PA Procurement guidelines and instructions.

As an exhibit to the Bid, provide the following:

Exhibit 6.1. Completed construction budget.

Exhibit 6.2. Completed Proposed Project Schedule, showing timing of major milestones and requested installment payments as completed work is invoiced.

4.7 SUMMARY SPREADSHEET

In Excel format, the Bidder must fill in the spreadsheet.

Exhibit 7.1. Completed bid Excel spreadsheet showing: Full Purchase Price; Federal Tax Benefits - Solar; Federal Tax Benefits - Storage; Additional Financing; System Size - Solar; System Size - Battery; Electricity Production; Battery Storage Capacity; Price per Watt Installed; Solar Panel Warranty Term; Inverter Warranty Term; Battery Warranty Term; and Workmanship Warranty Term.

See Excel template with the file name “Exhibit 7 Bid Summary PGC” that is provided with this bid package.

4.8 BID SIGNATURE.

The bid, in order to be considered a valid bid, must be signed by a principal officer or owner of the business entity that is submitting the bid. Such signature constitutes the Bidder’s representations that it has read, understood and fully accepted each and every provision of this bid unless an exception is described above.

Company Name
Company Address
Company Federal Tax Identification # XXX
By:

[Name]
[Title]
Telephone #: XXX
Email: XXX

5. SELECTION CRITERIA

5.2. SELECTION CRITERIA. Selection criteria will include:

- **Overall Quality:** Overall quality of bid and understanding of the intent of this Project.
- **Experience:** Bidder’s experience and proficiency in PV projects of comparable size and scope and in contracting with Pennsylvania entities or agencies.
- **Implementation Capacity:** Bidder’s staff capacity and ability to provide timely, quality design, installation services and long-term operation of the System.
- **Financial Capacity:** Bidder’s financial strength to successfully carry out this Project.
- **Proposed Hardware:** The extent to which the Bidder incorporates high-quality components and offers strong warranties on system components and labor, along with ability to comply with applicable domestic content and FEOC restrictions.

Value and Price: Some criteria (e.g., appropriate licensing and insurance, strong solar experience,

NABCEP certification) are considered essential for an acceptable bid. Other items (*e.g.*, pricing, quality of references, or capacity) will be used to rank the bids. Pricing is not the exclusive basis for selection—the Pennsylvania Game Commission may decide to select a Bidder whose pricing is not the lowest if the bid is found compelling for other reasons.

5.3. SELECTED BID

After evaluation of the bids and any interviews, the Pennsylvania Game Commission will select a Bidder for the Project. All Bidders who submitted a bid will be informed of the selection results.

The Pennsylvania Game Commission will select the bid that it deems to be in the Pennsylvania Game Commission's best interest and issue a Notice of Award to the selected Bidder. The Notice of Award will be subject to further discussions with the Bidder. The making of a preliminary award to a Bidder does not provide the Bidder with any rights and does not impose upon the Pennsylvania Game Commission any obligations. The Pennsylvania Game Commission is free to withdraw a preliminary award at any time and for any reason. A Bidder has rights - and the Pennsylvania Game Commission has obligations - only if final contracts, if any, are executed by the Pennsylvania Game Commission and a Bidder, and only to the extent of the obligations set out in such agreements. Neither this bid nor any actions taken by the Pennsylvania Game Commission create any obligation toward any Bidder.

The Pennsylvania Game Commission may in its sole discretion, clarify, modify, amend, or terminate this bid if it determines in its sole discretion that it is in the Commonwealth's best interest. The Pennsylvania Game Commission reserves all rights to reject any or all bids and to negotiate contract terms and conditions in the best interest of the Pennsylvania Game Commission.

The successful Bidder shall enter into a binding contract for the services contemplated by this bid. Such contract will incorporate the provisions of the selected bid and include such requirements and obligations typically included in construction and services contracts with the Pennsylvania Game Commission.

Appendix A: System Reference Design Assumptions

The following PV system design may be referenced for bids. It is expected that the final modules and design included in the bid produce the same or improved production values. Improvements are welcomed, especially in system performance or availability of materials or as Bidder deems necessary to meeting loads that are described in Table 1 on page 11 or other requirements in this bid package.

Bidders may select any components that they determine will satisfy system needs, so long as commercial off-the-shelf products are used. There is no requirement to use the specific components that are included as part of the example design in this bid package.

Performance:

- Estimated System Size: ~7.3 kW
- Annual Production: ~7,500 kWh
- Lithium Iron (LiFePO4) Storage: ~9kWh/day

Table 2: System Component Example Assumptions

Component	Name	Count
Inverters	PRIMO 6.0-1 (Fronius)	1 (6.00 kW)
AC Panels	1 input AC Panel	1
AC Home Runs	10 AWG (Copper)	1 (34.7 ft)
AC Home Runs	500 MCM (Copper)	1 (138.3 ft)
Combiners	2 input Combiner	1
Strings	10 AWG (Copper)	2 (34.7 ft)
PV Modules	Jinko, JKM405M-72H-BDVP (405W)	18 (7.29 kW)
Racking	IronRidge	1
Batteries	HomeGrid 4.8 kWh	3
Balance of system (additional wiring, conduit, combiner boxes, miscellaneous)	Various.	Various

Please see Figure 9 through Figure 12 for further design information.

Jinko 405 (copy) PA Game Commission, State Gamelands Rd, Wexford, PA 15090

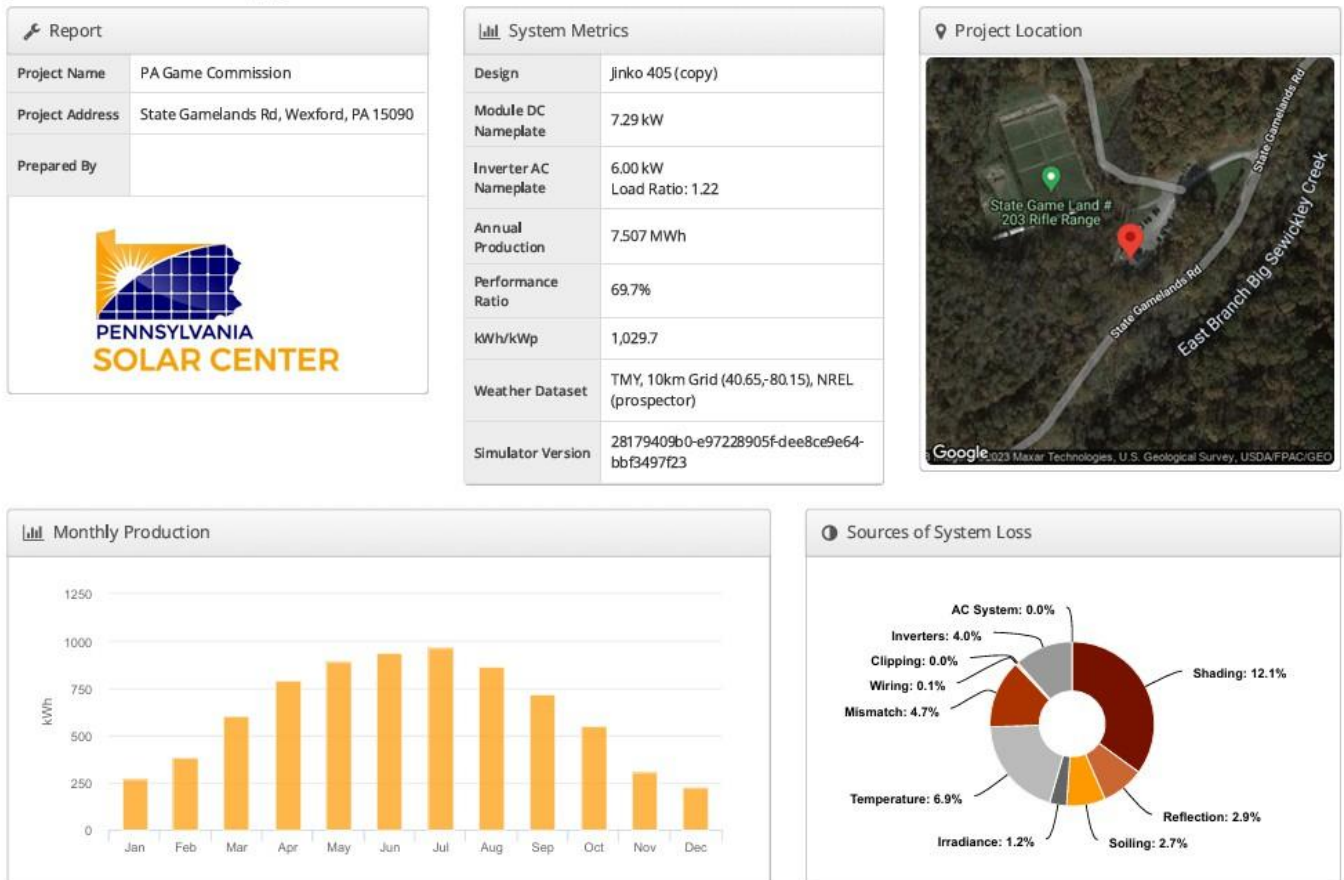


Figure 9: Helioscope (1 of 3)

⚡ Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,368.9	
	POA Irradiance	1,476.3	7.8%
	Shaded Irradiance	1,297.2	-12.1%
	Irradiance after Reflection	1,259.2	-2.9%
	Irradiance after Soiling	1,225.7	-2.7%
	Total Collector Irradiance	1,224.8	-0.1%
Energy (kWh)	Nameplate	8,932.7	
	Output at Irradiance Levels	8,829.6	-1.2%
	Output at Cell Temperature Derate	8,218.5	-6.9%
	Output After Mismatch	7,833.6	-4.7%
	Optimal DC Output	7,823.1	-0.1%
	Constrained DC Output	7,819.5	0.0%
	Inverter Output	7,506.7	-4.0%
	Energy to Grid	7,506.6	0.0%
Temperature Metrics			
	Avg. Operating Ambient Temp		12.9 °C
	Avg. Operating Cell Temp		26.4 °C
Simulation Metrics			
	Operating Hours		4653
	Solved Hours		4653

☁ Condition Set													
Description		Condition Set 1											
Weather Dataset		TMY, 10km Grid (40.65,-80.15), NREL (prospector)											
Solar Angle Location		Meteo Lat/Lng											
Transposition Model		Perez Model											
Temperature Model		Sandia Model											
Temperature Model Parameters	Rack Type	a		b		Temperature Delta							
	Fixed Tilt	-3.56		-0.075		3°C							
	Flush Mount	-2.81		-0.0455		0°C							
	East-West	-3.56		-0.075		3°C							
	Carport	-3.56		-0.075		3°C							
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D	
	15	13	6	1	1	0	1	1	1	1	1	6	
Irradiation Variance		5%											
Cell Temperature Spread		4° C											
Module Binning Range		-2.5% to 2.5%											
AC System Derate		0.50%											
Module Characterizations	Module				Uploaded By		Characterization						
	JKM 405M-72H-BDVP (Jinko)				HelioScope		Spec Sheet Characterization, PAN						
Component Characterizations	Device					Uploaded By		Characterization					
	PRIMO 6.0-1 (Fronius)					HelioScope		Spec Sheet					

📦 Components		
Component	Name	Count
Inverters	PRIMO 6.0-1 (Fronius)	1 (6.00 kW)
AC Panels	1 Input AC Panel	1
AC Home Runs	500 MCM (Copper)	1 (112.7 ft)
Strings	10 AWG (Copper)	2 (19.7 ft)
Module	Jinko_JKM405M-72H-BDVP (405W)	18 (7.29 kW)

🔌 Wiring Zones									
Description	Combiner Poles		String Size		Stringing Strategy				
Wiring Zone	-		7-10		Along Racking				

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Landscape (Horizontal)	18°	224°	0.1 ft	1x1	18	18	7.29 kW

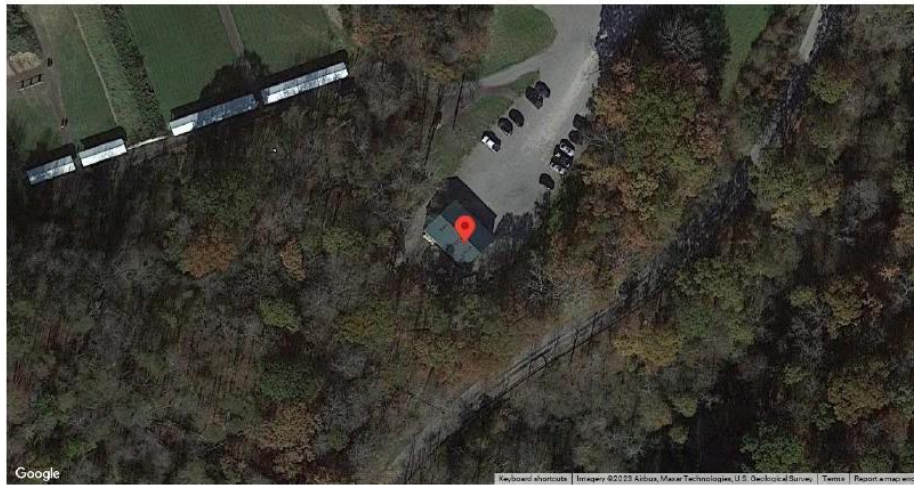
Figure 10: Helioscope (2 of 3)



Figure 11: Helioscope (3 of 3)

Project Details

Name	3177 State Gamelands Road	Date	09/28/2023
Location	3177 State Gamelands Road, Marshall, PA 15090	Total modules	18
Module	Jinko: JKM405M-6RL3 (30mm)	Total watts	7,290
Dimensions	Dimensions: 73.03" x 40.51" x 1.18" (1855.0mm x 1029.0mm x 30.0mm)	Attachments	72
ASCE	7-10	Rails per row	2



System Weight		Load Assumptions	
Total system weight	1,079.6 lbs	Wind exposure	B
Weight/attachment	15.0 lbs	Wind speed	115 mph
Racking weight	254.1 lbs	Ground snow load	25 psf
Distributed weight	2.8 psf	Attachment spacing landscape	4.0'

Roof Information			
Roof Material Family	Comp Shingle	Roof material	Comp Shingle
Building height	15 ft	Roof attachment	Flashfoot2
		Staggered attachments	No
Roof slope	14 °	Attachment hardware	Square
Risk category	II		
Specific gravity	0.42		

Span Details XR100 - Landscape

Zone	Max span	Max cantilever
1	9' 7"	3'
2	9' 7"	3'
3	9' 5"	3'

Figure 12: IronRidge Racking Report (1 of 2)

Reaction Forces XR100 - Landscape					
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (lbs)	Lateral Perp (lbs)
1	10.7	152	60	32	1
2	19.8	152	125	32	1
3	30.6	152	199	32	1

Roof Section 1

Details		Weights
Panels: 18	Provided rail: 252' [12 x 168", 12 x 84"]	Total weight: 1,079.6 lbs
Rail orientation: East-West	Attachments: 72	Weight/attachment: 15.0 lbs
Panel orientation: Landscape	Splices: 0	Total Area: 380.1 sq ft
Entry type: Graphical	Clamps: 60	Distributed weight: 2.8 psf

Diagram



Segments								
Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	2	12' 4"	12' 4"	2"	28' [2 x 168"]	8	0	6
			Row segment totals (x 6) →		168' [12 x 168"]	48	0	36
B	1	6' 3"	6' 3"	1' 2"	14' [2 x 84"]	4	0	4
			Row segment totals (x 6) →		84' [12 x 84"]	24	0	24

Figure 13: IronRidge Racking Report (2 of 2)