

MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION
STAFF REPORT

Address:	10124 Meadowneck Ct., Silver Spring	Meeting Date:	5/22/2024
Resource:	Spatial (undeveloped) Capitol View Park Historic District	Report Date:	5/15/2024
Applicant:	Marcel Schmidt (Maryland Solar Solutions, Inc., Agent)	Public Notice:	5/8/2024
Review:	HAWP	Tax Credit:	n/a
Permit No.:	1068991	Staff:	Dan Bruechert
Proposal:	Roof-mounted solar panels		

STAFF RECOMMENDATION

Staff recommends the Historic Preservation Commission (HPC) **approve** the HAWP application.

ARCHITECTURAL DESCRIPTION

SIGNIFICANCE: Spatial (undeveloped) Resource in the Capitol View Park Historic District
STYLE: Colonial Revival
DATE: 1983



Figure 1: The subject property was constructed in 1983, after the district was established.

PROPOSAL

The applicant proposes to install 17 (seventeen) solar panels in two arrays.

APPLICABLE GUIDELINES

The Historic Preservation Office and Historic Preservation Commission (HPC) consult several documents when reviewing alterations and new construction within the Capitol View Park Historic District. These documents include the historic preservation review guidelines in the approved and adopted amendment for the *Takoma Park Historic District (Guidelines)*, *Montgomery County Code Chapter 24A (Chapter 24A)*, and the *Secretary of the Interior's Standards for Rehabilitation (Standards)*, and the HPC's *Policy No. 20-01 ADDRESSING EMERGENCY CLIMATE MOBILIZATION THROUGH THE INSTALLATION OF ROOF-MOUNTED SOLAR PANELS*. The pertinent information in these four documents is outlined below.

Capitol View Park Historic District

Spatial Resources: Spatial resources are unimproved parcels of land which visually and aesthetically contribute to the setting of the historic district, and which can be regarded as extensions of the environmental settings of the significant historic resources.

Montgomery County Code; Chapter 24A-8

- (b) The commission shall instruct the director to issue a permit, or issue a permit subject to such conditions as are found to be necessary to ensure conformity with the purposes and requirements of this chapter, if it finds that:
 - (1) The proposal will not substantially alter the exterior features of an historic site or historic resource within an historic district; or
 - (2) The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter; or
 - (5) The proposal is necessary in order that the owner of the subject property not be deprived of reasonable use of the property or suffer undue hardship; or
- (d) In the case of an application for work on an historic resource located within an historic district, the commission shall be lenient in its judgment of plans for structures of little historical or design significance or for plans involving new construction, unless such plans would seriously impair the historic or architectural value of surrounding historic resources or would impair the character of the historic district. (Ord. No. 9-4, § 1; Ord. No. 11-59.)

Secretary of the Interior's Standards for Rehabilitation:

The Secretary of the Interior defines rehabilitation as “the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features, which convey its historical, cultural, or architectural values.” The *Standards* are as follows:

- 2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
- 9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be

compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Historic Preservation Commission Policy No. 20-01: Addressing Emergency Climate Mobilization Through the Installation of Roof-Mounted Solar Panels

Now, THEREFORE:

WHEREAS, Historic Area Work Permit decisions are guided by the criteria in Section 24A, The Secretary of the Interior’s Standards for Rehabilitation, and pertinent guidance from applicable master plan amendments and/or site or district-specific studies;

WHEREAS, The Secretary of the Interior’s Standards for Rehabilitation as interpreted by the National Park Service limit the placement of rooftop solar panels under Standards 2, 9, and 10 to less conspicuous locations;

WHEREAS, the County Council has established a Climate Emergency;

WHEREAS, the Historic Preservation is a body established by the County Executive and County Council;

WHEREAS, Section 24-8(b)(6) states, “In balancing the interest of the public in preserving the historic site or historic resource located within an historic district, with the interests of the public from the use and benefit of the alternative proposal, the general public welfare is better served by granting the permit;”

WHEREAS, the widespread use of solar panels, both for hot water and for electricity production, will reduce greenhouse gases in the county, in accordance with the aims of the Emergency Climate Mobilization resolution (Resolution No.: 18-974), it shall be the policy of the Historic Preservation Commission that:

- a. The preferred locations for solar panel installation(s) on a designated historic site or an historic resource located within an historic district is a) on the rear of the property, b) on non-historic building additions, c) on accessory structures, or d) in ground-mounted arrays;
- b. If it is not feasible to install solar panels in one of the identified preferred locations due to resource orientation or other site limitations; and,
- c. The roof is determined to be neither architecturally significant, nor a character-defining feature of the resource, nor is it a slate or tile roof, that unless it can be demonstrated that the solar array will be installed without damaging the historic character of the resource or historic fabric; then
- d. The public welfare is better served by approving a Historic Area Work Permit for solar panels on all visible side or front roof slopes under Section 24A-8(b)(6).

A Historic Area Work Permit (HAWP) is required for all work referenced in this policy.

STAFF DISCUSSION

The subject property is a side gable Colonial Revival house with an attached one-car garage. The immediate area of the Capitol View Park Historic District surrounding the subject property was developed in 1983. The applicant proposes to install 17 (seventeen) solar panels in two arrays. Fourteen of the panels will be installed on the main roof in a two-by-seven configuration and the remaining 3 (three) will be installed on the garage roof. Staff finds the proposal is compatible with the character of the house and surrounding non-contributing/spatial resources within the historic district.

Staff finds that none of the preferred locations are available to install solar panels. The lot is too small to accommodate a ground-mounted array, there are no accessory structures where the panels could be mounted, and the whole building is not historic. Staff also finds the subject property's south orientation requires panels to be installed on the front because panels on the rear would not collect sufficient light. The roof is of 1983 construction and is not a historically significant feature. Therefore, Staff finds the public welfare is better served by granting the HAWP application per 24A-8(b)(6) and (d) and Standards 2, 9, and 10.



Figure 2: The proposed solar installation.

All of the surrounding buildings were constructed after 1982 and the proposal will not visually impact any historic resources within the district.

STAFF RECOMMENDATION

Staff recommends that the Commission **approve** the HAWP application; under the Criteria for Issuance in Chapter 24A-8(b)(6), and (d), having found that the proposal will not substantially alter the exterior features of the historic resource and is compatible in character with the district and the purposes of Chapter 24A;

and with the *Secretary of the Interior's Standards for Rehabilitation #2, #9, and #10*;

and with the general condition that the applicant shall present an electronic set of drawings, if applicable, to Historic Preservation Commission (HPC) staff for review and stamping prior to submission for the Montgomery County Department of Permitting Services (DPS) building permits;

and with the general condition that final project design details, not specifically delineated by the

Commission, shall be approved by HPC staff or brought back to the Commission as a revised HAWP application at staff's discretion;

and with the general condition that the applicant shall notify the Historic Preservation Staff if they propose to make **any alterations** to the approved plans. Once the work is completed the applicant will contact the staff person assigned to this application at 301-563-3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.



**APPLICATION FOR
HISTORIC AREA WORK PERMIT**
HISTORIC PRESERVATION COMMISSION
301.563.3400

FOR STAFF ONLY:
HAWP# _____
DATE ASSIGNED _____

APPLICANT:

Name: _____ E-mail: _____
Address: _____ City: _____ Zip: _____
Daytime Phone: _____ Tax Account No.: _____

AGENT/CONTACT (if applicable):

Name: _____ E-mail: _____
Address: _____ City: _____ Zip: _____
Daytime Phone: _____ Contractor Registration No.: _____

LOCATION OF BUILDING/PREMISE: MIHP # of Historic Property _____

Is the Property Located within an Historic District? Yes/District Name _____
 No/Individual Site Name _____

Is there an Historic Preservation/Land Trust/Environmental Easement on the Property? If YES, include a map of the easement, and documentation from the Easement Holder supporting this application.

Are other Planning and/or Hearing Examiner Approvals /Reviews Required as part of this Application? (Conditional Use, Variance, Record Plat, etc.?) If YES, include information on these reviews as supplemental information.

Building Number: _____ Street: _____

Town/City: _____ Nearest Cross Street: _____

Lot: _____ Block: _____ Subdivision: _____ Parcel: _____

TYPE OF WORK PROPOSED: See the checklist on Page 4 to verify that all supporting items for proposed work are submitted with this application. Incomplete Applications will not be accepted for review. Check all that apply:

- | | | |
|---|--|--|
| <input type="checkbox"/> New Construction | <input type="checkbox"/> Deck/Porch | <input type="checkbox"/> Shed/Garage/Accessory Structure |
| <input type="checkbox"/> Addition | <input type="checkbox"/> Fence | <input type="checkbox"/> Solar |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Hardscape/Landscape | <input type="checkbox"/> Tree removal/planting |
| <input type="checkbox"/> Grading/Excavation | <input type="checkbox"/> Roof | <input type="checkbox"/> Window/Door |
| | | <input type="checkbox"/> Other: _____ |

I hereby certify that I have the authority to make the foregoing application, that the application is correct and accurate and that the construction will comply with plans reviewed and approved by all necessary agencies and hereby acknowledge and accept this to be a condition for the issuance of this permit.

Signature of owner or authorized agent

Date

HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFYING
[Owner, Owner's Agent, Adjacent and Confronting Property Owners]

Owner's mailing address	Owner's Agent's mailing address
Adjacent and confronting Property Owners mailing addresses	

Description of Property: Please describe the building and surrounding environment. Include information on significant structures, landscape features, or other significant features of the property:

Description of Work Proposed: Please give an overview of the work to be undertaken:

Work Item 1: _____	
Description of Current Condition:	Proposed Work:

Work Item 2: _____	
Description of Current Condition:	Proposed Work:

Work Item 3: _____	
Description of Current Condition:	Proposed Work:



Prepared by:
Colette Hayward
Maryland Solar Solutions, Inc.
410-363-4300
colette@marylandsolarsolutions.com

Quote #: 4353558

A personalized Solar Electric
Analysis for:

Marcel Schmidt,
10124 Meadowneck Ct, Silver Spring
MD 20910
240-421-2850
moschmi.1@gmail.com



Solar Energy System Proposal

Dear Marcel,

Maryland Solar Solutions, Inc. is privileged to present your Solar Energy System Proposal.

Best Regards,

Colette Hayward

Maryland Solar Solutions, Inc.

© Maryland Solar Solutions, Inc.
11436 Cronridge Dr. Suite V
Owings Mills MD 21117

Phone: 410-363-4300
Email:
mssicontact@marylandsolarsolutions.com
Web: www.marylandsolarsolutions.com

Scan QR code on your phone
to access the online proposal.



Recommended System Option

80%
Consumption Offset

\$53,717
Lifetime Electricity Bill Savings

\$16,706
Net Cost of this solar system

\$39,496
Estimated net savings over system lifetime



Imagery © Nearmap

Your Solution

REC Pure-R Black Series

7.140 kW of Solar Power
17 x REC420AA Pure-R
 420 Watt panels
 Up to **22.2%** Module efficiency
8,437 kWh per year

with 20 Year +5 ProTrust*
 Product Warranty.

*ProTrust available through REC
 Certified Solar Professionals



SolarEdge HD Wave Inverter

SolarEdge Technologies Ltd.
7.6 kW Total Inverter Rating
 1 x SE7600H-US [240V]



Power Optimizer

440 W Power Optimizer For Residential Installations
 17 x S440

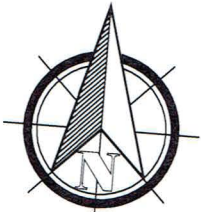
Warranties: 20 Year Panel Product Warranty, 25 Year Panel Performance Warranty, 12 Year Inverter Product Warranty



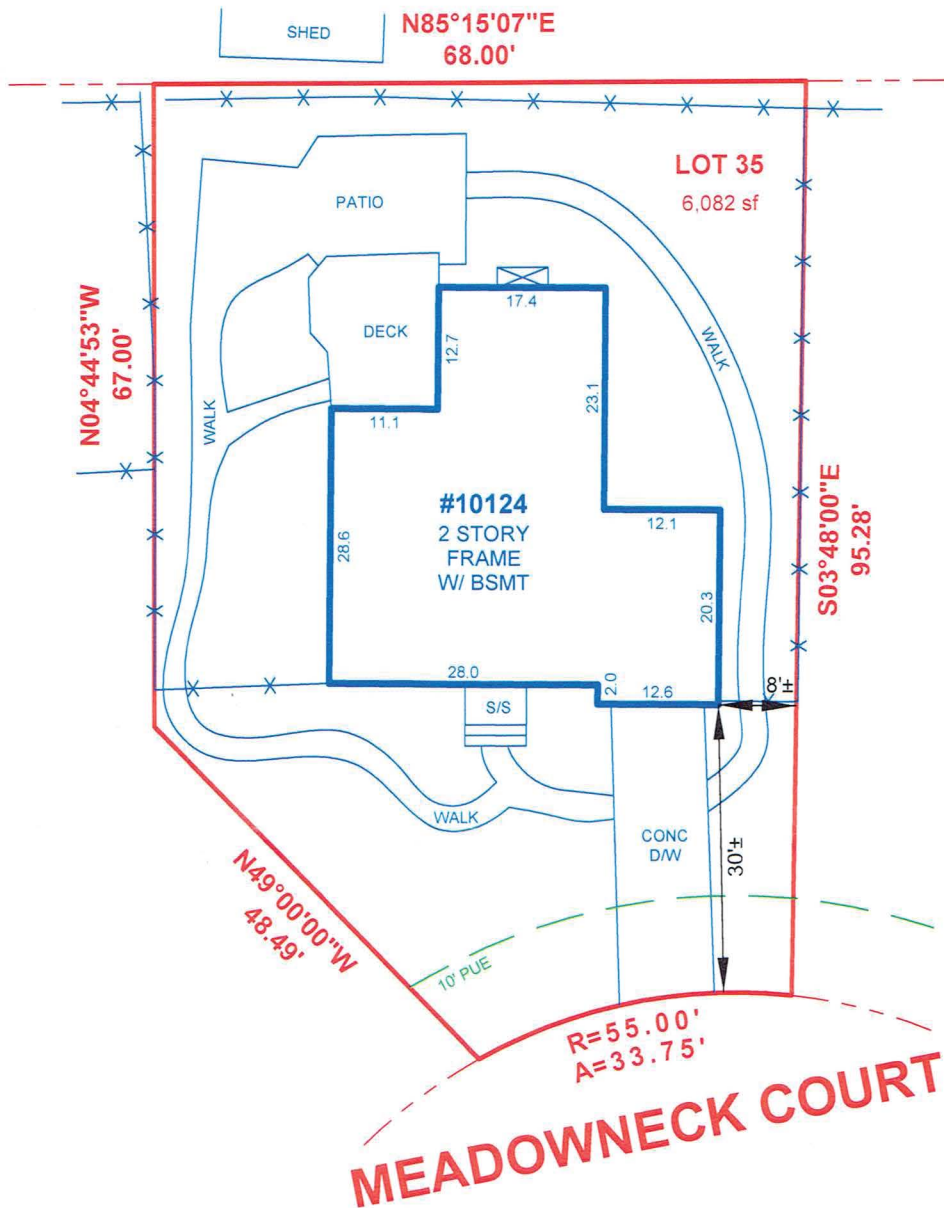
10124

10124

088268



PLAT NO. 14546



THE LEVEL OF ACCURACY OF DISTANCES TO APPARENT PROPERTY LINES IS: $1 \pm$

LOCATION DRAWING OF:
#10124 MEADOWNECK COURT
LOT 35
 BLOCK 1
CAPITOL VIEW PARK
 PLAT NO. 14546
 MONTGOMERY COUNTY, MARYLAND
 SCALE: 1"=20' DATE: 05-26-2022
 DRAWN BY: SM FILE #: 225707-200

- LEGEND:**
- X - FENCE
 - B/E - BASEMENT ENTRANCE
 - B/W - BAY WINDOW
 - BR - BRICK
 - BRL - BLDG. RESTRICTION LINE
 - BSMT - BASEMENT
 - C/S - CONCRETE STOOP
 - CONC - CONCRETE
 - D/W - DRIVEWAY
 - Ex. - EXISTING
 - FR - FRAME
 - MAC - MACADAM
 - G - GATE
 - O/H - OVERHANG
 - PUE - PUBLIC UTILITY ESMT.
 - PIE - PUBLIC IMPROVEMENT ESMT.
- COLOR KEY:**
- (RED) - RECORD INFORMATION
 - (BLUE) - IMPROVEMENTS
 - (GREEN) - ESMTS & RESTRICTION LINES

A Land Surveying Company

DULEY
 and
Associates, Inc.

Serving D.C. and MD.

14604 Elm Street, Upper Marlboro, MD 20772

Phone: 301-888-1111 Fax: 301-888-1114
 Email: orders@duley.biz On the web: www.duley.biz



SURVEYOR'S CERTIFICATE

I HEREBY STATE THAT I WAS IN RESPONSIBLE CHARGE OVER THE PREPARATION OF THIS DRAWING AND THE SURVEY WORK REFLECTED HEREIN AND IT IS IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN REGULATION 12 CHAPTER 09.13.06 OF THE CODE OF MARYLAND ANNOTATED REGULATIONS. THIS SURVEY IS NOT TO BE USED OR RELIED UPON FOR THE ESTABLISHMENT OF FENCES, BUILDING, OR OTHER IMPROVEMENTS. THIS PLAT DOES NOT PROVIDE FOR THE ACCURATE IDENTIFICATION OF PROPERTY BOUNDARY LINES, BUT SUCH IDENTIFICATION MAY NOT BE REQUIRED FOR THE TRANSFER OF TITLE OR SECURING FINANCING OR REFINANCING. THIS PLAT IS OF BENEFIT TO A CONSUMER ONLY INsofar AS IT IS REQUIRED BY A LENDER OR A TITLE INSURANCE COMPANY OR ITS AGENTS IN CONNECTION WITH THE CONTEMPLATED TRANSFER, FINANCING OR REFINANCING. NO TITLE REPORT WAS FURNISHED TO NOR DONE BY THIS COMPANY. SAID PROPERTY SUBJECT TO ALL NOTES, RESTRICTIONS AND EASEMENTS OF RECORD. BUILDING RESTRICTION LINES AND EASEMENTS MAY NOT BE SHOWN ON THIS SURVEY. IMPROVEMENTS WHICH IN THE SURVEYOR'S OPINION APPEAR TO BE IN A STATE OF DISREPAIR OR MAY BE CONSIDERED "TEMPORARY" MAY NOT BE SHOWN. IF IT APPEARS ENCROACHMENTS MAY EXIST, A BOUNDARY SURVEY IS RECOMMENDED.

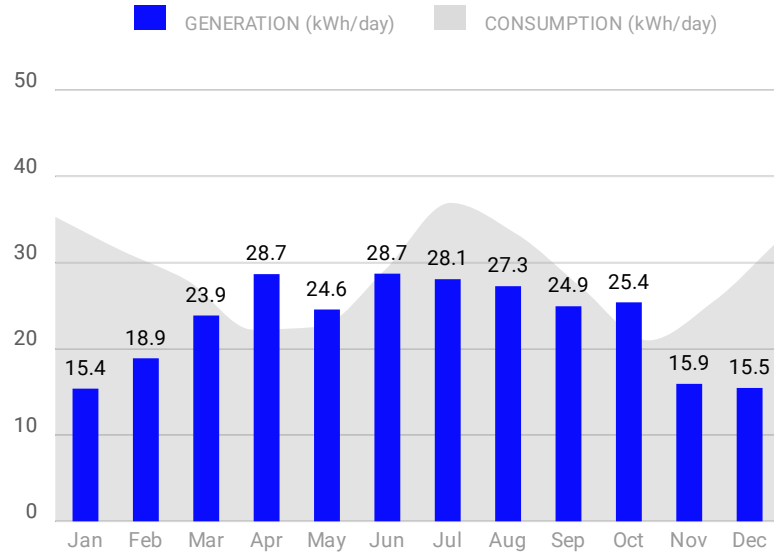
DULEY & ASSOC.

WILL GIVE YOU A 100% FULL CREDIT TOWARDS UPGRADING THIS SURVEY TO A "BOUNDARY/STAKE" SURVEY FOR ONE YEAR FROM THE DATE OF THIS SURVEY.

(EXCLUDING D.C. & BALT. CITY)

System Performance

80%
Energy From Solar



<p>44% Self-consumption</p>	<p>56% Export to grid</p>
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System Performance Assumptions: System Total losses: 9.1%, Inverter losses: 1.0%, Optimizer losses: 1.4%, Shading losses: 20.3%, Performance Adjustment: 0%, Output Calculator: System Advisor Model 2020.02.29.r2. Panel Orientations: 17 panels with Azimuth 176 and Slope 28.

The solar system(s) quoted in this proposal are not intended to be portable.

Environmental Benefits

Solar has no emissions. It just silently generates pure, clean energy.

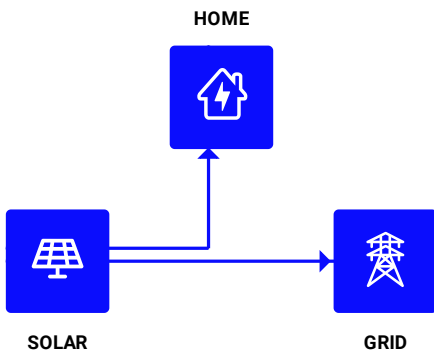


Each Year	
<p>80% Of CO₂, SO_x & NO_x</p>	<p>3 tons Avoided CO₂ per year</p>

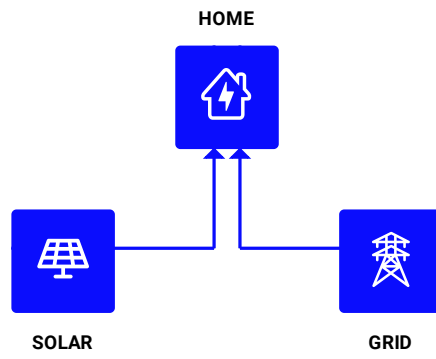
Over System Lifetime		
<p>63,734 Car miles avoided</p>	<p>660 Trees planted</p>	<p>73 Long haul flights avoided</p>

How your system works

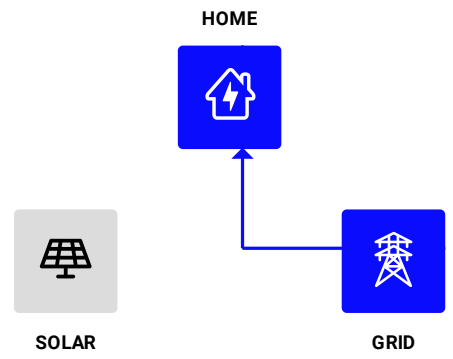
Generating Excess Solar



Partially Offset Usage



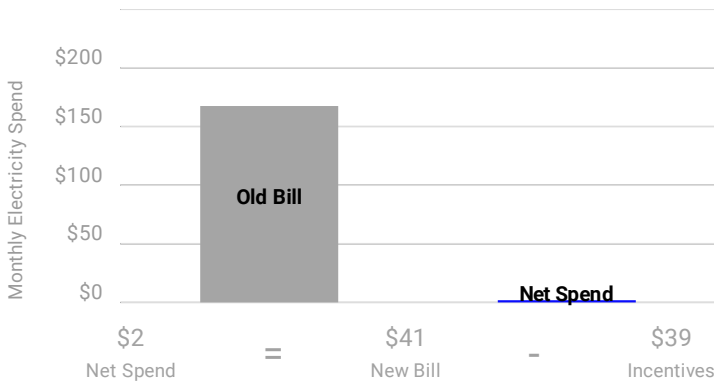
Night



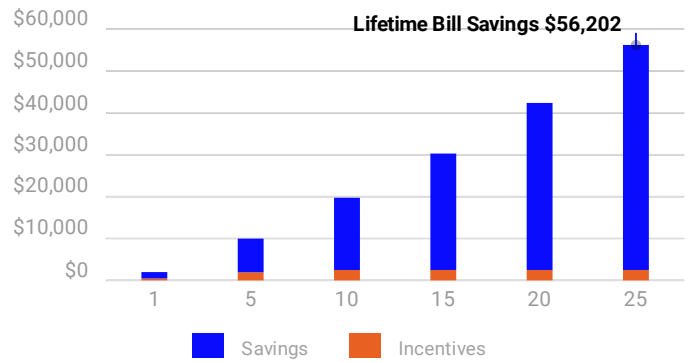


Electricity Bill Savings

First Year Monthly Bill Savings



Cumulative Bill Savings



Month	Solar Generation (kWh)	Electricity Consumption before solar (kWh)	Electricity Consumption after solar (kWh)	Utility Bill before solar (\$)	Utility Bill after solar (\$)	Maryland SRECs (\$)	Cumulative Energy Credit (\$)	Estimated Savings (\$)
Jan	477	1,094	618	188	110	26	0	78
Feb	529	879	350	153	66	29	0	87
Mar	740	867	127	151	29	41	0	121
Apr	860	667	(193)	118	9	47	0	109
May	761	700	(62)	124	9	42	11	116
Jun	862	873	12	188	9	48	8	179
Jul	870	1,145	274	243	56	48	0	187
Aug	845	1,033	188	220	47	47	0	173
Sep	748	811	63	175	21	41	0	153
Oct	787	650	(137)	141	9	43	28	132
Nov	478	766	288	134	28	26	0	106
Dec	479	1,014	535	175	96	26	0	79

Performance Based Incentives

Performance Based Incentives (Over System Lifetime)	\$2,484.25 \$465.73 in year 1
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Your projected energy cost is calculated by considering a 3.0% increase in energy cost each year, due to trends in the raising cost of energy. This estimate is based on your selected preferences, current energy costs and the position and orientation of your roof to calculate the efficiency of the system. Projections are based on estimated usage of 10500 kWh per year, assuming Residential Service (Montgomery County) Electricity Tariff.

Your electricity tariff rates may change as a result of installing the system. You should contact your electricity retailer for further information.

Proposed Tariff Details - Pepco - (MD) R (Montgomery County)
Energy Charges



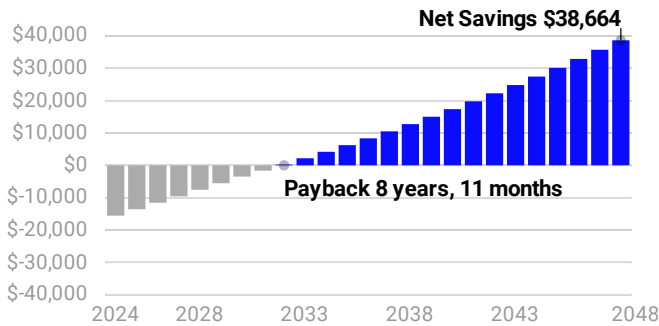
Summer Usage Charge <i>All Day from 31 May to 30 Oct</i>	\$0.20 / kWh
Winter Usage Charge <i>All Day from 31 Oct to 30 May</i>	\$0.16 / kWh
Fixed Charges	
Fixed Charge	\$8.54 / month



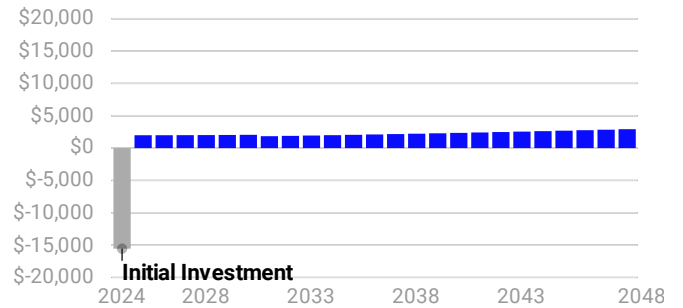
Net Financial Impact Cash

$$\begin{array}{rcl}
 \$56,202 & - & \$17,538 & = & \$38,664 \\
 \text{Utility Bill Savings} & & \text{Net System Cost} & & \text{Estimated Net Savings}
 \end{array}$$

Cumulative Savings From Going Solar



Annual Savings From Going Solar



\$38,664
Net Present Value

8 Years 10 Months
Discounted Payback Period

220%
Total Return on Investment

11.0%
Rate of Return on Investment

Year	Electricity Consumption (kWh)	Solar Generation (kWh)	Utility Bill (before solar) (\$)	Utility Bill (after solar) (\$)	Maryland SRECs (\$)	Total Energy Spend (After) (\$)	Annual Savings (from solar) (\$)	System Costs (Net of Dealer Incentives) (\$)	Customer Incentives (Upfront) (\$)	Net Savings (\$)	Cumulative Impacts (\$)
2024	10,500	8,437	2,010	488	466	23	1,987	25,054	7,516	(15550)	(15550)
2025	10,500	8,416	2,070	507	423	84	1,986	0	0	1985	(13564)
2026	10,500	8,395	2,132	526	384	142	1,990	0	0	1989	(11574)
2027	10,500	8,374	2,196	545	348	197	1,999	0	0	1998	(9576)
2028	10,500	8,353	2,262	566	316	250	2,012	0	0	2012	(7563)
2029	10,500	8,332	2,330	587	287	300	2,030	0	0	2029	(5533)
2030	10,500	8,311	2,400	609	261	348	2,051	0	0	2051	(3482)
2031	10,500	8,290	2,472	631	0	631	1,840	0	0	1840	(1642)
2032	10,500	8,268	2,546	655	0	655	1,891	0	0	1891	249
2033	10,500	8,247	2,622	679	0	679	1,943	0	0	1943	2192
2034	10,500	8,226	2,701	704	0	704	1,997	0	0	1996	4189
2035	10,500	8,205	2,782	730	0	730	2,052	0	0	2051	6240
2036	10,500	8,184	2,865	757	0	757	2,108	0	0	2108	8349



Year	Electricity Consumption (kWh)	Solar Generation (kWh)	Utility Bill (before solar) (\$)	Utility Bill (after solar) (\$)	Maryland SRECs (\$)	Total Energy Spend (After) (\$)	Annual Savings (from solar) (\$)	System Costs (Net of Dealer Incentives) (\$)	Customer Incentives (Upfront) (\$)	Net Savings (\$)	Cumulative Impacts (\$)
2037	10,500	8,163	2,951	785	0	785	2,166	0	0	2166	10515
2038	10,500	8,142	3,040	814	0	814	2,226	0	0	2226	12741
2039	10,500	8,121	3,131	844	0	844	2,287	0	0	2287	15028
2040	10,500	8,100	3,225	874	0	874	2,350	0	0	2350	17379
2041	10,500	8,079	3,322	907	0	907	2,415	0	0	2414	19794
2042	10,500	8,057	3,421	940	0	940	2,481	0	0	2481	22275
2043	10,500	8,036	3,524	974	0	974	2,550	0	0	2549	24825
2044	10,500	8,015	3,630	1,010	0	1,010	2,620	0	0	2619	27444
2045	10,500	7,994	3,738	1,047	0	1,047	2,692	0	0	2691	30136
2046	10,500	7,973	3,851	1,085	0	1,085	2,766	0	0	2765	32902
2047	10,500	7,952	3,966	1,124	0	1,124	2,842	0	0	2841	35744
2048	10,500	7,931	4,085	1,165	0	1,165	2,920	0	0	2919	38664

Estimates do not include replacement costs of equipment not covered by a warranty. Components may need replacement after their warranty period. Financial discount rate assumed: 0.0%



Quotation

Payment Option: Cash

17 x REC Solar 420 Watt Panels (REC420AA Pure-R) 1 x SE7600H-US [240V] (SolarEdge Technologies Ltd.) 17 x S440	
Standard System Price	\$23,865.60
SolarEdge Inverter Warranty Extension (25 yrs)	\$233.00
Critter Guard	\$1,195.00
Educator Discount on Critter Guard (20%)	\$-240.00
Total System Price	\$25,053.60
Purchase Price	\$25,053.60

Additional Incentives

Federal Investment Tax Credit (ITC) <small>The Federal Solar Tax Credit or Federal Investment Tax Credit (ITC) for systems that are placed in service in 2022 or later and begin construction before 2033.</small>	\$7,516.08
Net System Cost	\$17,537.52

Price excludes Retailer Smart Meter should you want us to install your Smart Meter it will be an additional cost.

Payment Milestones

Initial Deposit	7,516.08
First Day of Installation	7,516.08
Upon Completion of Installation	7,516.08
Upon Interconnection Signoff by Utility	2,505.36
Total	25,053.60



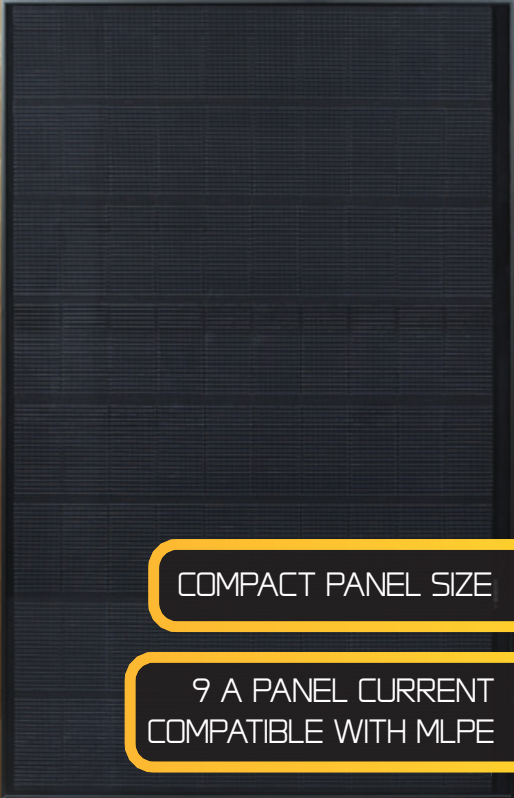
This proposal has been prepared by Maryland Solar Solutions, Inc. using tools from OpenSolar. Please visit www.opensolar.com/proposal-disclaimer for additional disclosures from OpenSolar.

SOLAR'S MOST TRUSTED



REC ALPHA PURE-R SERIES

PRODUCT SPECIFICATIONS



COMPACT PANEL SIZE

9 A PANEL CURRENT
COMPATIBLE WITH MLPE

430 WP
223 W/M²



ELIGIBLE



LEAD FREE
ROHS COMPLIANT

EXPERIENCE



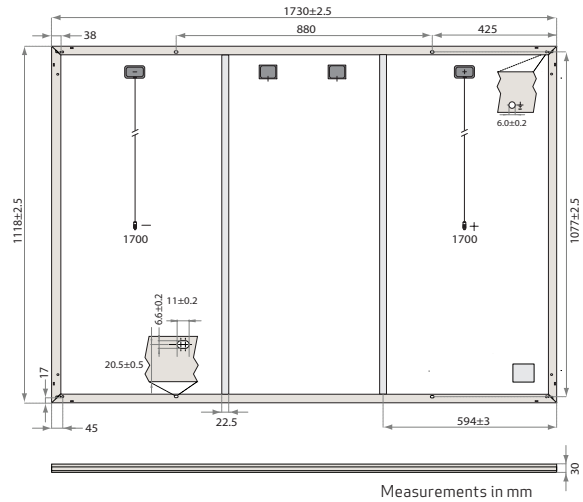
PERFORMANCE

REC ALPHA PURE-R SERIES

PRODUCT SPECIFICATIONS

GENERAL DATA

Cell type:	80 half-cut REC heterojunction cells with lead-free, gapless technology
Glass:	3.2 mm solar glass with anti-reflective surface treatment in accordance with EN 12150
Backsheet:	Highly resistant polymer (black)
Frame:	Anodized aluminum (black)
Junction box:	4-part, 4 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790
Connectors:	Stäubli MC4 PV-KBT4/KST4 (4 mm ²) in accordance with IEC 62852, IP68 only when connected
Cable:	4 mm ² solar cable, 1.7 + 1.7 m in accordance with EN 50618
Dimensions:	1730 x 1118 x 30 mm (1.93 m ²)
Weight:	21.5 kg
Origin:	Made in Singapore



ELECTRICAL DATA

Product Code*: RECxxxAA Pure-R

	312	320	327
Power Output - P _{MAX} (Wp)	312	320	327
Watt Class Sorting - (W)	0/+10	0/+10	0/+10
Nominal Power Voltage - V _{MPP} (V)	46.6	47.1	47.6
Nominal Power Current - I _{MPP} (A)	6.70	6.78	6.88
Open Circuit Voltage - V _{OC} (V)	55.8	56.0	56.3
Short Circuit Current - I _{SC} (A)	7.12	7.18	7.24
Power Output - P _{MAX} (Wp)	410	420	430
Watt Class Sorting - (W)	0/+10	0/+10	0/+10
Nominal Power Voltage - V _{MPP} (V)	49.4	50.0	50.5
Nominal Power Current - I _{MPP} (A)	8.30	8.40	8.52
Open Circuit Voltage - V _{OC} (V)	59.2	59.4	59.7
Short Circuit Current - I _{SC} (A)	8.81	8.89	8.97
Power Density (W/m ²)	212	218	223
Panel Efficiency (%)	21.2	21.8	22.3

Values at standard test conditions (STC: air mass AM1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). * Where xxx indicates the nominal power class (P_{MAX}) at STC above.

MAXIMUM RATINGS

Operational temperature:	-40 ... +85°C
System voltage:	1000 V
Test load (front):	+ 7000 Pa (713 kg/m ²)*
Test load (rear):	- 4000 Pa (407 kg/m ²)*
Series fuse rating:	25 A
Reverse current:	25 A

* See installation manual for mounting instructions.
Design load = Test load / 1.5 (safety factor)

WARRANTY

	Standard	REC ProTrust	
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	All	≤25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

See warranty documents for details. Conditions apply

CERTIFICATIONS (PENDING)

IEC 61215:2016, IEC 61730:2016, UL 61730	
IEC 62804	PID
IEC 61701	Salt Mist
IEC 62716	Ammonia Resistance
ISO 11925-2	Ignitability (EN 13501-1 Class E)
IEC 62782	Dynamic Mechanical Load
IEC 61215-2:2016	Hailstone (35mm)
IEC 62321	Lead-free acc. to RoHS EU 863/2015
ISO 14001, ISO 9001, IEC 45001, IEC 62941	



TEMPERATURE RATINGS*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P _{MAX} :	-0.26 %/°C
Temperature coefficient of V _{OC} :	-0.24 %/°C
Temperature coefficient of I _{SC} :	0.04 %/°C

*The temperature coefficients stated are linear values

DELIVERY INFORMATION

Panels per pallet:	33
Panels per 40 ft GP/high cube container:	858 (26 pallets)

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:

