Maryland
Energy Administration

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Calculating Minimum Benefits to the Consumer

Resources to assist Participating Contractors with compliance with Section 2.3 of the FY25 Maryland Solar Access Program Consumer Protection Policy

(Last Updated 4/29/25)

The Brighter Tomorrow Act of 2024 requires MEA to publish: "The minimum benefits that an eligible customer-generator must receive under an agreement with a third party." The FY25 Maryland Solar Access Program Consumer Protection Policy establishes minimum savings that a solar contract must deliver to the consumer to be eligible for a grant.

The following guidance is designed to assist contractors with calculating the minimum benefits for the most common project locations and types. The contractor is obligated to comply with the minimum benefits requirement for all projects.

Current Avoidable Rates

To calculate minimum savings, the participating contractor must first identify the customer's "current avoidable rate," which varies by utility and includes the standard offer service supply rate in addition to delivery charges and other charges offset by net metered customers. To assist with this calculation, MEA will publish on its website, and twice annually update, the customer's avoidable rate for each larger electric utility.

Here are the current avoidable rates for the larger electric utilities in Maryland *(last updated 12/31/24)*:

Table 1: Current Avoidable Rates

	PEPCO	BGE	Delmarva Power	Potomac Edison
Current Avoidable Rate ($/kWh)	0.212	0.170	0.201	0.132

Maximum Offers to the Consumer

Based on the current avoidable rate, the participating contractor can calculate the maximum offer allowed under the FY25 Maryland Solar Access Program Consumer Protection Policy for a power purchase agreement or an equivalent maximum offer for a solar lease agreement, solar system purchase agreement, or solar loan agreement.

Note: The "maximum offer" is inclusive of all line item costs associated with the solar system, excluding line items for enabling home repairs (e.g. roof replacement, structural repair).

1. "**For solar power purchase agreements with an escalator rate of 0%**, the maximum offer of the first year's PPA rate, at the time the solar contract is signed, must be at least 25% below the customer's avoidable rate, including the standard offer service supply rate in addition to delivery charges and other charges offset by net metered customers."

Table 2: Maximum First Year Offers without PPA Escalator

	PEPCO	BGE	Delmarva Power	Potomac Edison
Current Avoidable Rate ($/kWh)	0.212	0.170	0.201	0.132
Maximum Offer: first year PPA rate ($/kWh)	0.159	0.127	0.151	0.099

2. **"For solar power purchase agreements with an escalator rate greater than 0% and under no circumstances more than 3%**, the maximum offer of the first year's PPA rate, at the time the solar contract is signed, must be at least 35% below the customer's avoidable rate, including the standard offer service supply rate in addition to delivery charges and other charges offset by net metered customers."

Table 3: Maximum First Year Offers with PPA Escalator

	PEPCO	BGE	Delmarva Power	Potomac Edison
Current Avoidable Rate ($/kWh)	0.212	0.170	0.201	0.132
Maximum Offer: first year PPA rate ($/kWh)	0.138	0.110	0.131	0.086

3. **"For a solar power lease agreement, solar power loan agreement, or solar system purchase agreement**, the grant application must demonstrate that the total costs for the first full year do not exceed the equivalent maximum offer."

The equivalent offer is calculated using the Net Present Value (NPV) of the agreement. NPV is the sum of all the customer's cash inflows (e.g., electricity savings) and outflows (e.g., loan, lease, or purchase payments) over the life of the solar system but discounted to today's present value. To show that a lease, loan, or purchase agreement is equivalent to a PPA, both agreements must show the same NPV.

An equivalent maximum offer calculator[1] is available to derive equivalent maximum offer terms for a given system. The following content presents both the calculations used to determine equivalent terms via NPV and guidance on using the calculator.

Table 4 is a list of terms and definitions used to calculate equivalent maximum offers. **Table 5** summarizes the formulas for each major output.

[1] https://energy.maryland.gov/residential/SiteAssets/Pages/incentives/Maryland-Solar-Access-Program/FY25%20MSAP%20Maximum%20Offer%20Calculator%20(2.21.2025).xlsx

Table 4: Equivalent Offer Terms and Definitions

Term	Definition
N	Total Term Length of a PPA or Lease [yr]
n	A year within a PPA or Lease term [yr]
S	Projected First-year PV System Production [kWh]
d	Annual System Degradation Rate [0.50%]
P	Maximum-Offer First-year PPA Rate [$/kWh]
r	Discount Rate [4.75%]
r_p	PPA Escalation Rate [%]
r_l	Lease Escalation Rate [%]
i	Loan Interest Rate [%]
T	Loan Term Length [yr]
NPV_{PPA}	Net Present Value of a PPA from the perspective of customer cost [$]
PMT_{Lease}	Maximum first-year monthly payment for a lease [$/mo]
PMT_{Loan}	Maximum first-year monthly payment for a loan [$/mo]
PR_{Loan}	Loan Principal, after incentives, rebates, and fees [$]

Table 5: Maximum Equivalent Offer Formulas

Maximum Equivalent Offer Components	Formula
(A) Net Present Value of a Proposed PPA [$]	$NPV_{PPA} = \sum_{n=1}^{N} \frac{S(1-d)^{n-1} * P(1+r_p)^{n-1}}{(1+r)^{n-1}}$
(B) Equivalent First-year Monthly Payment for a Lease [$/mo][2]	$PMT_{Lease} = \frac{NPV_{PPA} * (r - r_l)}{12 * [1 - (1 + r_l)^N * (1 + r)^{-N}]}$
(C) Equivalent System Purchase Cost [$]	NPV_{PPA}
(D1) Equivalent First-year Monthly Payment for a Loan [$/mo]	$PMT_{Loan} = \frac{NPV_{PPA} * r}{12 * [1-(1+r)^{T}]}$

[2] Updated 29 April 2025, corrects the sign of the "N" exponent in the last binomial in the denominator to negative.

(D2) (Optional) Loan Principal After Incentives, Rebates, and Fees [$]	$PR_{Loan} = PMT_{Loan} * \frac{1-(1+i/12)^{-12T}}{i/12}$
(D3) (Optional) Loan Interest Rate [%]	In Excel: $i = RATE(L * 12, -PMT_{Loan}, X, 0)$

The calculations to determine the loan components (loan length, principal, and interest rate) require two of the three to be included as inputs to solve for the remaining term. The loan length is treated as a required input, while the option is available to solve for either the principal or the interest rate. Equations (D2) and (D3) in Table 2 are thus mutually exclusive, where (D2) is used when solving for the loan principal as the last component, and (D3) for the interest rate, respectively. Formula (D3) requires iterative solving to determine the final value, so the Microsoft Excel equivalent formula is provided for use.

Most Equivalent maximum offers can be calculated manually using the provided formulas, however the available calculator does so automatically when provided appropriate inputs.

Equivalent Maximum Offer Calculator Guidance

This section walks through each line, input, and output of the equivalent maximum offer calculator. The calculator is a Microsoft Excel file available to download from the program webpage[3] in the "Program Documents" section.

Non-adjustable assumed values are within gray cells, yellow cells represent vendor-provided inputs, and the resulting calculated values are displayed within blue cells. Each line or column is labeled by a number and letter (e.g., 3a) as reference to the following descriptions.

1. Static Assumed Values are values hard-coded into the sheet, and should not change between systems or offers:

a. The System Owner NPV Discount Rate represents the increased time value for capital in the present, rather than the future. A Discount Rate

[3] https://energy.maryland.gov/residential/Pages/incentives/Maryland-Solar-Access-Program.aspx

of 5% indicates that the time-value of $1 today would be worth $0.95 in the following year.

b. The Annual Degradation Percentage of the system is the expected loss in average production year-over-year.

	Static Inputs	
1a	System Owner NPV Discount Rate [%]	4.75%
1b	Annual Degradation [%]	0.50%

2. System, PPA, Lease, and Rate Inputs cover all inputs required to generate the equivalent offers for leases and system purchases:

a. The *First-Year Projected Total PV Generation* represents the expected annual production in kWh of a PV system during the first year of operation. This can be taken directly from solar simulation software (e.g., PV Watts, Helioscope).

b. The *PPA and Lease Term, System Lifespan* represents the length of time in years of the proposed PPA or Lease, set as a default to 25 years.

c. The *PPA Escalator* is the percentage increase in the PPA rate to customer year-over-year. The default value set is 3.00%.

d. The *Lease Escalator* is the percentage increase in annual lease payments year-over-year. A lease with or without an escalator will still give the same NPV as the baseline PPA value – the maximum first-year lease payment will adjust accordingly. Annual escalation cannot exceed 3.00%.

e. The *Maximum-Offer: First-Year PPA Rate* is taken directly from the MEA-published guidance and is different per utility. The input value should align with the published rate for the respective utility service territory. The PPA $/kWh to input is the maximum offer **with escalator**, taken from the values published in **Table 3**.

	System, PPA, Lease, and Rate Inputs	
2a	First-Year Projected Total PV Generation [kWh/yr]	11,112
2b	PPA and Lease Term, System Lifespan (25-Year Maximum) [yrs]	25
2c	PPA Escalator [%/yr]	3.00%
2d	Lease Escalator [%/yr]	0.00%
2e	Maximum-Offer: First Year PPA Rate with escalator [$/kWh]	$ 0.138

3. PPA, Lease, and System Purchase Outputs provide the maximum equivalent offers for leases and system purchases relative to the baseline PPA:

a. The *Maximum First-Year PPA Rate* is a passthrough of the prior PPA input, for reference and comparison.
b. The *Maximum First-Month Lease Payment* is the maximum monthly payment a customer can be charged for the first year of a proposed PV Lease. Proposed lease terms in the application must be at-or-below the calculated value for the system. This is for the lease component and related fees only and does not include remaining utility charges.
c. The *Maximum System Purchase Cost* is the highest **post-incentives and rebates** offer than can be made to a customer for direct purchase of a system. A cost of $25,000 would represent the cost to customer after the application of all related investment tax credits, incentives, rebates, and similar reductions. System purchase offers in applications must be shown to be at-or-below this value for a given PV system.

	Equivalent Maximum Offers	
3a	Maximum First-Year PPA Rate [$/kWh]	$0.138
3b	Maximum First-Month Lease Payment [$/mo]	$164.34
3c	Maximum System Purchase Cost, Post-Incentives and Rebates [$]	$28,504.61

4. Loan Inputs and Outputs determine the equivalent offer components for the loan option. The maximum equivalent offer depends on the loan term length, principal, and maximum monthly payment charged to the customer.

a. The *Loan Term* is the proposed length of the loan in years and cannot exceed 25 years.
b. The *Solve for Loan Interest Rate or Loan Principal* is a drop-down cell that allows for the calculator to either solve for 1) the maximum loan principal given an interest rate, or 2) the maximum interest rate given an input principal. If “Principal” is selected, then a proposed interest rate must be entered. If “Rate” is selected, then a proposed loan principal must be entered.
c. If the “Rate” option is selected for 4b, then the input *Loan Principal* is made available. The loan principal input represents the principal after incentives, rebates, and all loan-related fees are applied. Tax credits, incentives, and rebates are not expected to coincide with the start of the loan term – a proposed loan amount may exceed the value on an application. Applications must show that the loan principal would be

at-or-below the input value if all pertinent cost reduction components were applied coincident with the start of the loan.

d. If the "Principal" option is selected for 4b, then the input *Loan Interest Rate* is made available. The *Loan Interest Rate* represents the monthly-compounding interest rate on the remaining balance of the loan.
e. The *Maximum Loan Payment* output is the maximum monthly loan payment that can be charged to a customer for the term of the loan. There is no escalator, and the monthly loan payment is inclusive of interest.
f. The last row will adjust depending on the input for 4b: if "Rate" was selected, then the maximum allowed interest rate given an input term and principal will be provided. If "Principal" was selected, then the maximum allowed principal given an input term and interest rate will be provided. Constraints and requirements for the input loan principal and interest rate (4c and 4d) are also applicable to the respective 4f output.

	Loan Inputs and Outputs	
4a	Loan Term (25-Year Maximum) [yrs]	15
4b	Solve for Loan Interest Rate or Loan Principal:	Rate [%/yr]
4c	Loan Principal (Post-Incentives and Rebates, Fees Included) [$]	$ 25,000
4d	Loan Interest Rate [%/yr]	2.91%
4e	**Maximum Loan Payment [$/mo]**	**$225.00**
4f	**Maximum Interest Rate [%/yr]**	**7.02%**

5. The accompanying table within the calculator provides annual breakouts of customer costs by product and other information given the provided inputs:

a. The annual PPA cost to the customer, inclusive of any active escalator.
b. The annual Lease cost to customer, inclusive of any active escalator.
c. The annual Loan cost to the customer.
d. The average monthly system production year-over-year.
e. The comparative PPA rate each year, inclusive of any active escalator.
f. A table displaying the calculated NPV for the PPA, Lease, and Loan. Each option should show the same value as to indicate that all offers are equivalent. The system purchase cost is equal to the NPV of the PPA, as it represents the customer cost of the system if in today's dollars.

	5a	5b	5c	5d	5e
Year	PPA Cost [$/yr]	Lease Cost [$/yr]	Loan Cost [$/yr]	Avg. System Production [kWh/mo]	PPA Rates [$/kWh]
0					
1	$1,533	$1,972	$2,700	926	$0.138
2	$1,572	$1,972	$2,700	921	$0.142
3	$1,611	$1,972	$2,700	917	$0.146
4	$1,651	$1,972	$2,700	912	$0.151
5	$1,692	$1,972	$2,700	908	$0.155

5f	Net Present Value (Cost to Customer)		
	PPA	Lease	Loan
	$28,505	$28,505	$28,505