

DOCKETED	
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Comment Received From: Wayne Alldredge
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Docket Number: 19-BSTD-08

SMUD Solar Shares - Multifamily Application

Additional submitted attachment is included below.

Dear Commissioners, and CEC staff,

Title 24 Code states:

“All low-rise residential buildings shall have a photovoltaic (PV) system meeting the minimum qualification requirements as specified in Joint Appendix JA11, with annual electrical output equal to or greater than the dwelling’s annual electrical usage as determined by Equation 150.1-C”

The equation used to calculate this is

EQUATION 150.1-C ANNUAL PHOTOVOLTAIC ELECTRICAL OUTPUT

$$kW_{PV} = (CFA \times A) / 1000 + (ND_{well} \times B)$$

WHERE:

- kW_{PV} = kW_{dc} size of the PV system
- CFA = Conditioned floor area
- ND_{well} = Number of dwelling units
- A = Adjustment factor from Table 150.1-C
- B = Dwelling adjustment factor from Table 150.1-C

Until you get below 10 units in a multifamily setting, this works out to about 1.4 kW_{PV} per dwelling unit in Zone 12.

Let’s start our infrastructure conversation there. Community solar installations would certainly be considered when there are multifamily units, so 1.4kW of PV per unit being developed is reasonable.

SMUD is required by California law under SB100 to eventually get to 100% renewable power production. This is very important to remember. Even if no more homes get built in SMUD’s territory, they are still required BY LAW to invest in or procure renewable energy and retire fossil fuel energy production/procurement. The grid, by law, will get cleaner with or without multifamily developers and home builders funding community solar and installing any of these 1.4kW PV per unit systems.

Homes are going to be built, so let’s get back to our 1.4 kW of PV that has to be installed per dwelling unit and do some back of the napkin math...

- The Sacramento area has solar intensity that easily makes over 1,600 kWh per kW of panel annually (1,736 according to SMUD, but let’s be generous and use 1,600), so that’s about 2,240 kWh being generated for that 1.4 kW of panels.
- SMUD average cost per kWh retail during solar production hours is about \$0.10/kWh winter and average of about \$0.14/kWh summer. Solar PV produces more energy during the summer, so let’s call this average PV value of production per kWh as \$0.125. With no changes to anything, this is what the consumer is paying SMUD now. With no changes to anything, SMUD is responsible for providing that power to the consumer.
- 2,240 kWh x \$0.125 = \$280 annual financial benefit per unit with no CO₂ produced annually.
- Community solar will cost about \$2.00 per watt to install (when large in scale). That means each 1.4kW will cost about \$2,800 to install.

- Forgetting profits which are required to run a business, the simple recovery is $\$2,800 / \$280 = 10$ years. With allowing SMUD to make a reasonable profit and cover operational costs, let's say they get to recover the WHOLE $\$280$ for 12 years or $\$3,360$ per residence.

This assumption means no discount on the cost of energy to the consumer – likely ever, even after the payback period. Solar PV systems have a life expectancy far exceeding 25 years with 30 years at greater than 80% retained output efficiency common. At scale, even the inverters are capable of lasting over 15 years. Let's look at a 30 year example averaging the whole time to 90% output; $\$280 \times 90\% \times 30$ years - $\$1,500$ for inverter replacement = $\$6,060$ of revenue from a 1.4kW PV system over the life of a home loan. With SMUD's generosity in granting the homeowner/developer a benefit of $\$10/\text{kW}/\text{year}$ for 20 years ($\$200$), SMUD stands to collect roughly $\$5,800$ per unit (assuming they never raise electrical rates).

With Governor Newsome's 3.5 million housing units over 5 years, that works out to 132,710 housing units in SMUD's territory (assuming linear housing need of SMUD's current 1.5M population of California's 39.56M population). That's $\$767$ million in revenue from the 186,000 kW of panels, minimum, from this single 5-year home building period over the next 30 years.

1. Who's REALLY paying for this and is the investment benefit going to the people who are actually funding it?
2. What's a fair split of the economic benefit and for how long?
3. Do you think that if there is ANY cost to the builder in paying for Solar Shares that the payment on that development loan will not be passed on to the resident for the life of that loan or lease?
4. How long should the residents receive some credit? 20 years only? In perpetuity?
5. Should the credit be equal to the expected increase in loan or rent if costs are passed on?
6. Is there a mechanism for future owners upon sale of property or lease to "Opt Out" and gain control of their rooftops and rate schedules? Remember, the clean PV power goes to the general grid anyway. What if SMUD could re-allocate a pro-rata share of the investment requirement to take over for those who do wish to Opt Out?
7. Will Solar Shares install community solar PV at least to the size of EQUATION 150.1-C?
8. Do you think that 1.4 kW per housing unit is actually enough? Sure it 'complies', but is that even close to the average size of a homeowner's install? (Larger single family homes may require over 2 kW under JA11.)

It's my personal opinion that solar shares be limited to only multi-family properties (due to inadequate roof sizes per unit), or properties that have insufficient solar access due to shading beyond their control. Community Solar like Solar Shares in these two cases, gives developments a path to compliance when they simply cannot comply with on-site PV installation.

Therefore, Solar Shares IS a great idea for these two use cases. It puts PV on the grid that would otherwise have no benefit if it were forced to be installed on a shaded rooftop (which it wouldn't). I applaud the idea. However, it is a slippery slope when you open this option to virtually any development at the discretion of the builder when the result locks in the future resident who may want to do more than the bare minimum. And make no mistake, you allow one 'Solar Shares' program, you will end up allowing them throughout the state.

Implementation of community solar statewide should not become a disincentive affecting freedom of choice to those that have adequate solar access and want to do more for our environment.

Utilities MUST make the grid renewable with or without programs like Solar Shares, and the rate payer WILL ultimately be paying for it. It is the responsibility of the CEC to ensure this is accomplished in a fair manner.

Wayne D Alldredge

LEED AP, WELL AP, CEM, CEA, CBCP, CMVP, CalCTP ATT, HERS Rater

Reference:

All low-rise residential buildings shall have a photovoltaic (PV) system meeting the minimum qualification requirements as specified in [Joint Appendix JA11](#), with annual electrical output equal to or greater than the dwelling's annual electrical usage as determined by Equation 150.1-C:

EQUATION 150.1-C ANNUAL PHOTOVOLTAIC ELECTRICAL OUTPUT

$$kW_{PV} = (CFA \times A)/1000 + (ND_{well} \times B)$$

WHERE:

kW_{PV} = kWdc size of the PV system

CFA = Conditioned floor area

ND_{well} = Number of dwelling units

A = Adjustment factor from Table 150.1-C

B = Dwelling adjustment factor from Table 150.1-C

EXCEPTION 1 to Section 150.1(c)14: No PV is required if the effective annual solar access is restricted to less than 80 contiguous square feet by shading from existing permanent natural or manmade barriers external to the dwelling, including but not limited to trees, hills, and adjacent structures. The effective annual solar access shall be 70 percent or greater of the output of an unshaded PV array on an annual basis.

EXCEPTION 2 to Section 150.1(c)14: In climate zone 15, the PV size shall be the smaller of a size that can be accommodated by the effective annual solar access or a PV size required by the Equation 150.1-C, but no less than 1.5 Watt DC per square foot of conditioned floor area.

EXCEPTION 3 to Section 150.1(c)14: In all climate zones, for dwelling units with two habitable stories, the PV size shall be the smaller of a size that can be accommodated by the effective annual solar access or a PV size required by the Equation 150.1-C, but no less than 1.0 Watt DC per square foot of conditioned floor area

EXCEPTION 4 to Section 150.1(c)14: In all climate zones, for low-rise residential dwellings with three habitable stories and single family dwellings with three or more habitable stories, the PV size shall be the smaller of a size that can be accommodated by the effective annual solar access or a PV size required by the Equation 150.1-C, but no less than 0.8 Watt DC per square foot of conditioned floor area.

EXCEPTION 5 to Section 150.1(c)14: For a dwelling unit plan that is approved by the planning department prior to January 1, 2020 with available solar ready zone between 80 and 200 square feet, the PV size is limited to the lesser of the size that can be accommodated by the effective annual solar access or a size that is required by the Equation 150.1-C.

EXCEPTION 6 to Section 150.1(c)14: PV sizes from Equation 150.1-C may be reduced by 25 percent if installed in conjunction with a battery storage system. The battery storage system shall meet the qualification requirements specified in [Joint Appendix JA12](#) and have a minimum capacity of 7.5 kWh.

Table 150.1-C – CFA and Dwelling adjustment Factors

Climate Zone	A-CFA	B-Dwelling Units
1	0.793	1.27
2	0.621	1.22
3	0.628	1.12
4	0.586	1.21
5	0.585	1.06
6	0.594	1.23
7	0.572	1.15
8	0.586	1.37
9	0.613	1.36
10	0.627	1.41
11	0.836	1.44
12	0.613	1.40
13	0.894	1.51
14	0.741	1.26
15	1.56	1.47
16	0.59	1.22

Time-of-Day (5-8 p.m.) Rate details

The rates below are effective from January 1 to September 30, 2020. Rates will be updated October 1, 2020. [Learn more about upcoming rate changes.](#)

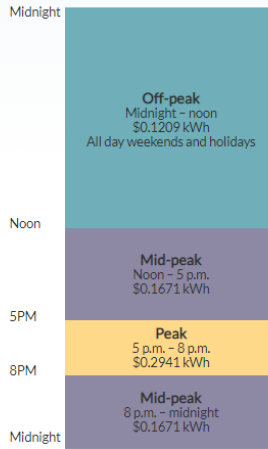
❄ Non-summer

October 1 - May 31



☀ Summer

June 1 - September 30



System Infrastructure Fixed Charge per month

\$21.05

SMUD Rates from their website.