BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop a Successor to Existing Net Energy Metering Tariffs Pursuant to Public Utilities Code Section 2827.1, and to Address Other Issues Related to Net Energy Metering.	Rulemaking 14-07-002 (Filed July 10, 2014)

JOINT PROPOSAL BY THE CALIFORNIA HOUSING PARTNERSHIP, CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE, BRIGHTLINE DEFENSE PROJECT, NATURAL RESOURCES DEFENSE COUNCIL, AND NATIONAL HOUSING LAW PROJECT (NONPROFIT SOLAR STAKEHOLDERS COALITION) ON IMPLEMENTATION OF ASSEMBLY BILL 693

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Date: August 3, 2016

Rulemaking 14-07-002

PROPOSAL FOR THE IMPLEMENTATION OF AB 693

Nonprofit Solar Coalition
Joint Submission

August 3, 2016

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Pursuant to the Rules of Practice and Procedure of the California Public Utilities Commission (Commission), the California Housing Partnership Corporation (CHPC), California Environmental Justice Alliance (CEJA), Brightline Defense Project (Brightline), the Natural Resources Defense Council (NRDC), and the National Housing Law Project (NHLP) collectively referred herein as the Nonprofit Solar Stakeholders Coalition, hereby submit a Joint Proposal to implement the Multifamily Affordable Housing Solar Roofs Program (Multifamily Solar Roofs Program) enacted by AB 693.

The Nonprofit Solar Stakeholders Coalition comprise of a large and diverse group of nonprofit organizations incorporated in the State of California that advocate on behalf of the interests of low income renter households, low-income and disadvantaged communities, nonprofit multifamily affordable housing organizations and those working to reduce energy consumption and greenhouse gas emissions and to create cleaner and healthier communities in California.

The members of the Nonprofit Solar Stakeholders Coalition have come together in common cause to develop and submit this Joint Proposal for implementing the Multifamily Solar Roofs Program. The households and communities that we advocate for are the direct and the intended beneficiaries of the AB 693 legislation: households vulnerable to rising energy prices, have high household energy cost burdens, have been largely underserved by California's renewable energy and energy efficiency programs, and often reside in geographic areas

disproportionately burdened by high rates of poverty, socio-economic disadvantages, and multiple sources of pollution and other environmental risk factors. Our objective in working together is to assist the Commission in meeting its responsibilities to develop a program design that satisfies the legislative mandates of AB 693, responds to the long-term energy needs of low-income renters and disadvantaged communities, and contributes to the broader purposes served by the implementation of the program including job placement and reducing greenhouse gas emissions.

The Joint Proposal by the Nonprofit Solar Stakeholders Coalition includes a detailed program design that is responsive to each of the questions and subject areas outlined in the Administrative Law Judge's (ALJ) July 8, 2016 ruling (ALJ Ruling) and additional areas that are essential to the implementation of the Multifamily Solar Roofs Program. First and foremost, the Multifamily Solar Roofs Program is fundamentally a transformational program. The Multifamily Solar Roofs Program will potentially reach over one third of the publically supported affordable multifamily rental housing market in California. The program's scope, which provides a platform for integrating energy efficiency, solar PV, and energy storage strategies, will influence the energy future of over 150,000 low-income households, and shape energy use and energy cost across this segment of the housing market for decades to come. The Nonprofit Solar Stakeholders Coalition ask that these facts and consequences related to the significance of the program be at the forefront of the Commission's deliberations.

The Joint Proposal gives considerable attention to matters of allocating generation and economic benefits to low-income tenants, the requirement for geographic diversity and special efforts needed to address the needs of CalEnvironScreen disadvantaged communities (DACs), the integration of energy efficiency goals into the program structure, the eligibility of energy storage and its role in preserving and enhancing energy benefits for this market, and the incentive structure needed to address financial barriers and scale investment in solar energy systems. The Joint Proposal also includes recommendations for a third-party statewide Program Administrator and the administrative processes and documentation requirements to implement the program.

The ALJ Ruling also references the October 21, 2015 ALJ Ruling requesting parties to Phase I of the AB 327 proceeding to comment on AB 693 ability to "count toward" the Commission's obligation to develop specific alternatives designed for the growth of Distributed Generation in disadvantaged communities. The Nonprofit Solar Stakeholders Coalition reminds the Commission that owners of affordable housing properties eligible under AB 693 did not have a reasonable opportunity to respond to the questions presented in the October 21, 2016 ALJ Ruling at that time. Since AB 693 targets affordable housing properties and the installation of eligible solar systems can only be accomplished under a program responsive to the needs of property owners and tenants residing at these properties, this omission resulted in the exclusion of the views of key stakeholders specifically included under AB 693. Following the issuance of the Second Amended Scoping Memo and Rule on March 4, 2016, CHPC, CEJA, and Brightline jointly sought clarification of the Scoping Memo and filed a Motion requesting public workshops to engage, educate and inform key constituency groups about key issues and questions affecting the implementation AB 693 before developing and submitting proposals for implementation. No action was taken on this Motion.

In response to this gap, members of the Nonprofit Solar Stakeholders have spent considerable time and resources to actively engage our constituencies and obtain feedback on the design of the Multifamily Solar Roofs Program, incentive structure, and requirements. While the public's interest and our outreach efforts would have benefited from the requested public workshops, we are confident that the Joint Proposal fairly represents the interest and views of our constituencies. The Nonprofit Solar Stakeholders Coalition requests that the Commission give its full attention to the issues and recommendations presented in our proposal so that the interests of the intended beneficiaries of the AB 693 legislation have an appropriate voice in this proceeding.

We thank the Commission for the opportunity to submit proposals and comments on this important and transformative program and for its thoughtful consideration of our Joint Proposal.

I. Introduction

Assembly Bill (AB) 693, enacted on October 8, 2015, established the Multifamily Affordable Housing Solar Roofs Program (AB 693 or Multifamily Solar Roofs Program). The Multifamily Solar Roofs Program is a legislative response to the profound gap in the level of solar installations serving low-income renters and disadvantaged communities.

The legislation seeks to provide low-income renters located in multifamily housing with greater access to clean energy solutions. In enacting the bill, the Legislature found and declared that:

> It is the goal of the state to make qualifying solar energy systems more accessible to low-income and disadvantaged communities and, as in the case of the Multifamily Affordable Housing Solar Roofs Program, to install those systems in a manner that represents the geographic diversity of the state.[1]

The lack of solar access by low-income households and disadvantaged communities was a core element in the justification for enacting the bill, as evidenced by testimony presented in support of AB 693. On July 13, 2015, the California Environmental Justice Alliance (CEJA), the primary sponsor of the legislation, provided testimony to the Senate Committee on Energy, Utilities, and Communications that "even with the existing renewable energy programs for low-income and disadvantaged communities, there has only been less than 1% penetration into disadvantaged communities."[2] Similarly, at the same hearing, a representative of the MASH Coalition stated that "the growth in solar in California's residential markets facilitated by the CSI Initiative has largely bypassed low-income renters and disadvantaged communities in California [and] an analysis by the Center for American Progress reported that only 4.2% of the solar installations under the California Solar Initiative (CSI) served households with incomes of less than $40,000 per year."[3]

Major Program Goals and Beneficiaries of AB 663

[1] AB 693 Section 1(e).
[2] Testimony of Strela Cervas, Senate Committee on Energy, Utilities, and Communications. Public hearing on AB 693, July 13, 2015.
[3] Testimony of Randall Simmrin, Senate Committee on Energy, Utilities, and Communications. Public hearing on AB 693, July 13, 2015.

AB 693 was enacted to provide a new framework to affirmatively mitigate barriers to solar PV access at affordable rental properties, and to ensure that benefits from renewable energy are available to these underserved markets. The intended beneficiaries of the Multifamily Solar Roofs Program are low-income renters residing in eligible affordable multifamily properties. In providing these benefits, the design of the Multifamily Solar Roofs Program must carry out various programmatic purposes, which are summarized in Table 1 below

TABLE 1 – Major Programmatic Purposes of AB 693

Scope of Program	▪ Install eligible solar energy systems at eligible affordable multifamily properties. ▪ Ensure geographic diversity for solar energy systems installed through the program. ▪ Facilitate energy efficiency improvements in conjunction with solar energy installations. ▪ Provide economic benefits in disadvantaged communities. ▪ Advance policies for renewable energy and reducing emissions.
Allocations from Systems	▪ Allocate electricity collected and distributed from eligible solar energy system to utility customers at qualified affordable multifamily rental housing sites.
Benefits from Systems	▪ Reduce peak energy use. ▪ Adopt utility tariffs that provide, and continue to provide, net economic benefits to low-income tenants.
Incentive Structure	▪ Set incentive levels to make solar energy systems financially feasible and to account for "split incentive" barriers. ▪ Align incentive levels with reasonable estimates of solar costs. ▪ Reduce incentive levels to account for resources and other project contributions that offset project investment costs. ▪ Provide project financing tools where necessary and appropriate to support incentive structures and maximize ratepayer benefits.
Hiring	▪ Provide a local hiring program to place qualified persons from disadvantaged communities in jobs created by the solar program.
Consumer Protection	▪ Protect and preserve energy benefits provided to program participants and ratepayers. ▪ Safeguard affordable housing properties and tenants from financial risks.

Additional Purposes

AB 693 must support other legislative mandates including policies governing solar installations, priorities applicable to the source of funding for AB 693, and statewide energy efficiency goals applicable to utility-funded programs. These additional purposes are summarized in Table 2 below.

TABLE 2 – Related Statutory Purposes

SB1	SB1 established basic requirements applicable to solar PV installations under the California Solar Initiative. Purposes under SB 1 that are applicable to AB 693's program design include: ▪ Facilitate cost-effective investments in peak electricity generation capacity where ratepayers recoup the cost of their investment by avoiding purchases of electricity at peak rates. ▪ Provide monetary incentives for solar energy systems that have the primary purpose of collecting and distributing solar energy. ▪ Require reasonable and cost-effective energy efficiency improvements in existing buildings as a condition of providing incentives for eligible solar energy systems. ▪ Develop financing options that help offset the installation costs of the solar energy systems.
Section 748.5	Program funding for AB 693 is authorized under Section 748.5 of the Public Utilities Code, which specifies that eligible funding uses include clean energy and energy efficiency projects. The purpose of Section 748.5 to fund a broad range of integrated clean energy solutions should be reflected in the program design.
SB 350	AB 693 was enacted in the same legislative session as SB 350. SB 350 sets a goal to double energy efficiency savings. It requires the CPUC to adopt energy efficiency and demand reduction targets and to implement the targets through programs that provide financial incentives, rebates, technical assistance, and support customers to increase energy efficiency. The implementation of AB 693 provides a means to address the purposes of SB 350.
AB 802	AB 802, enacted on October 8, 2015, requires utilities to provide energy usage information to multifamily properties with five or more active residential or nonresidential utility accounts and establishes energy benchmarking requirements for the covered properties. Implementation of the program will begin on January 1, 2017. As such, energy data sharing and benchmarking set by AB 802 should be incorporated into AB 693's program design.

AB 693's Market Objectives and Program Framework are Different than MASH

The goal to install *at least* 300 megawatts (MW) of new solar capacity under Multifamily Solar Roofs Program is orders of magnitude greater than what was proposed or occurred under Multifamily Affordable Solar Housing (MASH). With funding levels up to $100 million annually, the Multifamily Solar Roofs program could be installed on over 2,000 properties, comprising more than 150,000 low-income renters, and reaching roughly 30% of the affordable multifamily housing market in California.

This scale and scope of the Multifamily Solar Roofs Program will have a significant transformative effect on California's affordable multifamily rental housing market, and have a lasting effect of California's affordable housing inventory for decades to come. As such, significant attention and efforts are needed to ensure that AB 693's program design anticipates the long-term energy issues affecting this market segment. The market transformation that will occur under AB 693 is also an unprecedented opportunity for multifamily properties to play a pivotal role in the Commission's strategies and plans to move California to a smarter grid.

As a result of significant transformation contemplated by AB 693 and the opportunity to facilitate this change in a manner that advances the transition to a smart grid in low-income markets, any premise that AB 693 is merely an extension of the Multifamily Affordable Solar Housing (MASH) program must be rejected. The AB 693's legislative history also argues strongly against this conclusion.

Within the Legislative Councils Digest and the text of AB 693 there is no statement that the Multifamily Solar Roofs Program was intended as an extension of MASH. In fact, there are only three references to MASH within the text of AB 693 and none of those references state or infer that AB 693 was intended to extend MASH or its program structure.[4]

On the contrary, the CPUC analysis of AB 693 stated that:

[4] Within AB 693, MASH is first referenced in the Legislative Digest in the context of the 10% set-aside for the SASH and MASH programs under the California Solar Initiatives. The second reference is in section 2870(g)(1). MASH is mentioned in the context of utility bill reductions being achieved through tariffs that allow for the allocation of credits, "such as virtual net metering tariffs designed for the Multifamily Affordable Solar Housing program…." The third reference is in section 2870(j)(1) to the requirement that assessments of the AB 693 program sent to the Legislature include a summary of the other solar programs including MASH.

> The Multifamily Affordable Housing Renewables Program would have several important differences from the current Multifamily Affordable Solar Housing (MASH) and Single Family Affordable Solar Homes (SASH) incentive programs.[5]

Several of these differences are specifically discussed in the analysis, including the inclusion of other "qualifying renewable energy systems" in addition to solar-electric systems.

Indeed, throughout the legislative process legislators, committee staff, and program stakeholders asked questions about the similarities and differences between what was proposed under AB 693 and the current MASH program. In response, briefing materials were publically disseminated to legislators, committee and legislative staffs, and other stakeholders that identified deficiencies with current solar PV programs and approaches for serving low-income households in multi-tenant buildings, and identified program elements in AB 693 that provided advantages over the MASH program. These materials include an AB 693 FAQ document sent to affordable housing stakeholders on September 7, 2015immediately before the Senate vote, and on June 30, 2015, which is provided in Appendix A.[6] These publically disseminated materials as well as statements such as the previously referenced testimony by the MASH Coalition that "current solar programs have not penetrated the affordable housing markets" and have "largely bypassed low-income renters and disadvantaged communities in California" make it clear that new approaches and solutions were being sought through the AB 693 legislative initiative.

Moreover, if it was the intent of the AB 693 sponsors to continue the MASH program or retain the same program structure, the legislature could have and would have extended funding for a MASH 3.0 program as the legislature did when extending funding for the MASH 2.0.[7] Neither outcome was included in the enacted AB 693 legislation. Therefore, statements

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[5] Curran, Elizabeth and Kochanowsky, Amy, California Public Utilities Commission, Energy Division, "Division Analysis: Multifamily Affordable Housing Renewables Program."

[6] Briefing materials shown in Attachment A were sent to Housing California, the California Housing Consortium, the Southern California Association of Nonprofit Housing, the California Coalition for Rural Housing, the Non-Profit Housing Association of Northern California, the San Diego Housing Commission, and the California Housing Partnership Corporation.

[7] See AB 217 (Bradford, 2013), *available at* http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB217.

that AB 693 "was designed around Decision 15-01-027 (AB 217 or MASH 2.0 proceeding"[8] are at best inconsistent with the public record, and, as a point of departure for considering how to implement the new Multifamily Solar Roofs Program, are misleading[9] and apparently driven by parochial interests.

In summary, AB 693 must be taken up on its own terms and responsibly weigh the broad impacts this program will have on low-income renters and property owners in developing a program design that is responsive to a new set of purposes and legislative mandates.

[8] Everyday Energy, Notice of Exparte Communication, July 1, 2016.

[9] There are several statement in the Notice of Exparte Communication that merit rebuttal. For example, the focus on affordable multifamily housing in AB 693 was to ensure that installed solar energy systems continue to benefit low-income renters over the useful life of the system. Affordable housing typically has very long affordability periods in which rents are restricted up to 55 years. These same restrictions do not exist for other market segments. AB 693 was not intended, as suggested in the Notice, to readdress the conflicts between Everyday Energy and Shorebreak in the MASH proceeding over the eligibility of mobile homes. Additionally, the program proposal disseminated to Senator Hueso and other public officials in February would have required CARE households at multifamily properties to convert or opt into standard utility rate schedules. This approach would have required added enrollment complexities and minimum tenant PV installations and other protections to ensure that the program would not harm CARE households. This structure for delivering tenant benefits was rejected, and is altogether different from AB 693 and MASH. Furthermore, the statement that the MASH program is oversubscribed does not connote that the projects in the reservation queue will be implemented as proposed. We are concerned that the MASH reservations in the queue may be overstated from what may actually be accomplished. Challenges and financial uncertainty associated with utility allowance adjustments, overlooked by MASH, can adversely affect the scaling of solar to serve residents. Lastly, contrary to the suggestion that Everyday Energy and CALSEIA drafted and are responsible for AB 693, environment justice organizations were already working with CALSEIA on the development of a proposal to serve low income households and disadvantaged communities when Everyday Energy joined the discussion, and that CEJA had a lead role in the drafting and development of the legislation that was eventually enacted.

II. Program Funding[10]

The Multifamily Solar Roofs Program is funded from Cap and Trade auction revenues. Section 2870(c) of Part 2 of Division 1 of the Public Utilities Code provides that:

> The commission shall annually authorize the allocation of one hundred million dollars ($100,000,000) or 10 percent of available funds, whichever is less, from the revenues described in subdivision (c) of Section 748.5 for the Multifamily Affordable Housing Solar Roofs Program, beginning with the fiscal year commencing July 1, 2016, and ending with the fiscal year ending June 30, 2020.[11]

The use, distribution, and management of this funding resource must be undertaken in a manner consistent with the regulations and policies pertaining to greenhouse gas (GHG) allowances under Article 5 of Title 17 of the California Code of Regulations, Sections 95800 to 96023, and the requirements adopted by the Commission under Decision (D.)12-12-033.

Contributions of GHG Allowance Proceeds

The allocations made pursuant to Section 748.5 are from GHG allowances received by electrical distribution utilities pursuant to subdivision (b) of Section 95890 of Title 17 of the California Code of Regulations and may be used for clean energy and energy efficiency projects. These utilities include Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), Liberty Utilities (CalPeco Electric) LLC (Liberty), and PacifiCorp.

We propose that all of the electrical corporations be required to contribute GHG allowance proceeds toward the Multifamily Solar Roofs Program to ensure that low-income renters throughout the state have access to solar energy systems. If the customers of an electric corporation are included in the program design, the utility must be required to contribute GHG proceeds as directed by AB 693. The exclusion of one or more of the electrical corporations from this program could potentially undermine the requirement to provide broad geographic diversity and solar access to qualified affordable multifamily properties. In particular, exceptions to making GHG allowance contributions from PG&E, SCE, and SDG&E

[10] Questions 18,19,20, and 21 of the ALJ's July 8, 2016 Ruling are covered in this section.
[11] AB 693 amendments to Public Utility Code (PUC). Part 2 of Division 1 of the PUC, Section 2870(c).

should not even be considered since there are large numbers of eligible multifamily affordable properties and renters within each of these utilities' service jurisdictions.

Contribution Levels

Currently, roughly $1 billion in annual allowance revenues are distributed to residential customers as the California Climate Credit from the designated electrical corporations. The table below shows an estimate of 2015 auction proceeds prepared by the California Assembly in September of 2015, and percentage contribution from each utility.

Table 3 - Electric IOU Allowance Proceeds Available for Clean Energy and Energy Efficiency Projects, 2015

Utility	Forecast of 2015 Allowance Auction Proceeds[12,13]	Percent of Auction Proceeds
Pacific Gas and Electric Company	$438,602,830	39.31%
Southern California Edison	$562,499,489	50.41%
San Diego Gas & Electric Company	$98,717,335	8.85%
PacifiCorp	$11,870,145	1.06%
Liberty Utilities (CalPeco Electric)	$4,078,910	.037%
Total	**$1,115,768,709**	

AB 693 contemplates that all of the participating electrical corporations will contribute a similar percentage share of their GHG allowances to support the Multifamily Solar Roofs program.

In addition to requiring all electric investor-owned utilities (IOU) to contribute towards AB 693, we propose that the contributions from participating electrical corporations be calculated using one of the following two methods, depending on whether the total GHG allowances for the year being calculated exceed $1 billion:

[12] Source: Assembly Floor Analysis, September 10, 2015. Analysis Prepared by: Sue Kateley http://www.leginfo.ca.gov/pub/15-16/bill/asm/ab_0651-0700/ab_693_cfa_20150910_231003_asm_floor.html

[13] Total forecast of allowance auction proceeds for 2015 includes allowance proceeds that will were expected to be received in 2015 inclusive of franchise fees and uncollectibles, and the remaining balance of allowance proceeds received in previous years (inclusive of interest) that has not yet been distributed.

- If the allowances for all electrical corporations total $1 billion or less, each electrical corporation should contribute 10% of its GHG allowances for that year;

- If the combined total allowances exceed $1 billion, each electrical corporation's contribution should be based on the electrical corporation's percentage of the total allowances for all participating electrical corporations multiplied by $100 million.

Pursuant to the ALJ's request, tables 4 and 5 provide quantitative examples of the above-described approaches.

Table 4 - Electric IOU Contributions
Total Auction Allowances Exceed $1 Billion

Utility	GHG Allowances	% of Total Allowances	AB 693 Contribution	% Contributed
PG&E	$438,602,830	39.31%	$39,309,476	8.96%
SCE	$562,499,489	50.41%	$50,413,628	8.96%
SDG&E	$98,717,335	8.85%	$8,847,473	8.96%
PacifiCorp	$11,870,145	1.06%	$1,063,854	8.96%
Liberty (CalPeco Electric)	$4,078,910	.037%	$365,569	8.96%
Total	**$1,115,768,709**	**100%**	$100,000,000	

Table 5 - Electric IOU Contributions
Total Auction Allowances Equal To or Less Than $1 Billion

Utility	GHG Allowances	% Contributed	AB 693 Contribution
PG&E	$350,882,264	10.00%	$35,088,226
SCE	$449,999,591	10.00%	$44,999,959
SDG&E	$78,973,868	10.00%	$7,897,387
PacifiCorp	$9,496,116	10.00%	$949,612
Liberty (CalPeco Electric)	$3,263,128	10.00%	$326,313
Total	**$892,614,967**	10.00%	$89,261,497

Mechanism for Directing Allocations and Data Confidentially

The regulatory mechanism for the allocation of GHG allowances and proceeds is established under Article 5 of Title 17 of the California Code of Regulations, *California Cap on Greenhouse Gas Emissions and Market-based Compliance Mechanisms to Allow for the Use of*

Compliance Instruments Issued by Linked Jurisdictions. Under these guidelines, the electrical corporation shall calculate the value of these allowances based on the average market clearing price of the four quarterly auctions held in the same calendar year that the allowances are allocated. The monetary value of allowances received by the electrical corporation is deposited directly into compliance accounts.[14]

We propose that the electrical corporations be required to retain or reserve 10% of the GHG allowance value in an AB 693 reserve account pending a determination by the Commission on the annual program funding level at the beginning of each funding year. The annual program level should be based on the cumulative value of GHG allowances for each of the participating electrical corporations. Once the Commission sets the annual program level and the calculated contribution for each electrical corporation, the Commission should order the transfer of funds from the electrical corporation's AB 693 reserve account to the AB 693 program account administered by the Program Administrator. The methods for determining the funding levels for the Multifamily Solar Roofs Program and calculating the contributions for each participating electrical corporation should be transparent to assure program stakeholders and members of the public that the correct amount of funds are allocated to the program each year.

This process does not require the disclosure of information concerning internal bidding strategies or bidding information. Rather, what is required is that the Commission provide sufficient regulatory oversight of the reporting and accounting required under Title 17 of the Code of California Regulations and also provide timely disclosures of the cumulative annual GHG allocations and revenues received by each participating electrical corporation to be credited directly to the residential, small business, and emissions-intensive trade-exposed retail customers of the electrical corporation pursuant to subdivision (b) of Section 95890 of Title 17 of the California Code of Regulations.

Funding Availability and Annual Allocations

The amount of funding available on a year-to-year basis for the Multifamily Solar Roofs program will depend on the results of the auctions, which are held at scheduled quarterly

[14] Article 5 of Title 17 of the California Code of Regulations, Sections 95800 to 96023.

intervals throughout a year. To provide a predictable level of annual funding for qualifying projects and account for time differences in the collection of auction allowance proceeds and year to year revenue uncertainties associated with auction-based funding, we propose that the program funding levels be set annually based on the auction proceeds for the previous year.

Pursuant to Section 2870(c), the collection of receipts supporting AB 693 commenced on July 1, 2016. Pursuant Section 2870(f)(1), the Commission is required to authorize the award of monetary incentives for qualifying solar energy systems. Under this framework, a full year of scheduled auctions collections will have been completed by July 1, 2017. The program budget for investments during the first program year, July 1, 2017 to June 30, 2018, would be set based on the GHG allowance revenues collected through June 30, 2017. Subsequent annual funding allocations for program investments would similarly be based on the prior year's allowance revenues. Program funding not obligated or expended during a program year should be either carried over in a reserve fund or added to the annual funding receipts for future years to support more program investments.

Program Funding After 2020

AB 693 further provides that:

> The commission shall continue authorizing the allocation of these funds through June 30, 2026, if the commission determines that revenues are available after 2020 and that there is adequate interest and participation in the program.[15]

At this point the outlook for continued funding after 2020 is uncertain. In as much as the planning and design of AB 693 must consider the question of whether funding will be available after 2020, the Commission should state in its decision how and when the issue of future program funding will be taken up and, if known, what factions the Commission will consider in deciding whether revenues are available.

[15] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(c).

Eligible Uses

Funding for Multifamily Solar Roofs Program must support a variety of administrative, technical support, and capital investment activities. Funding under AB 693 should provide the following:

- *Administrative Funding:* 10% of the annual program allocations should be set aside and used for program administration and to provide for enhanced program support necessary to successfully implement the program. In addition to carrying out core administrative requirements, such as developing program guidelines, managing program applications, reservation and payment processes, verifying program eligibility, conducting outreach to housing organizations, and undertaking periodic program evaluations, the implementation of AB 693 will require the Program Administrator to undertake the following supplemental actions as specified in the legislation:
  i. *Ensure alignment of program costs and accounting of leveraged resources in setting program incentives and making periodic updates to incentive structure required under 2870(f)(4) and (5)*
  ii. *Ensure compliance geographic diversity requirements under Section 1(e)*
  iii. *Conduct outreach and provide technical assistance to property owners and tenants in disadvantaged and underserved communities to increase access to solar energy systems*
  iv. *Engage community based organizations to facilitate tenant education*
  v. *Develop protocols and make compliance determinations pursuant to tenant PV allocations and tenant economic benefits requirements under 2870(f(2) and 2870(g)(1)*
  vi. *Monitor compliance with local hiring requirements under 2870(f)(6)*
  vii. *Provide technical support for implementing energy efficiency assessments*
  viii. *Facilitate "one-stop" access to utility energy efficiency program resources to implement requirements under Section 2870(f)(7)*
  ix. *Develop protocols and verify compliance with system performance and operation and maintenance requirements under Section 2870(f)(3)*
  x. *Conduct analysis and market demand assessments required under Section 2870(j)(1) and (2)*

The scope of these additional administrative and support activities justify the need for the proposed budget level.

- *Capital Funding* – 90% of the annual program allocations should be expended on eligible program capital costs. Eligible capital expenses should include equipment and labor costs to install:
  i. *PV systems serving residential units located at eligible multifamily properties inclusive of rooftop, carport, and ground mounted solar energy systems*
  ii. *PV systems serving the common areas of eligible multifamily properties*

iii. *Energy storage systems integrated with on-site PV systems installed at multifamily properties*
iv. *Energy efficiency measures for amounts not funded by ratepayer and Cap and Trade utility energy efficiency as discussed in Section X.*

- *Geographic Distributions* – To provide the Program Administrator with flexibility in committing program resources pursuant to the requirements for geographic diversity, and to implement projects in a timely manner, the funding provided to the Multifamily Solar Roofs Program should be available to any affordable multifamily rental property meeting the eligibility requirements and located within any of the service areas of contributing electrical corporations. Criteria for ensuring geographic diversity should be adopted to ensure the fair allocation of resources across utility jurisdictions during the overall duration of the program.

Funds Control and Evaluation

Section 2870(j)(1) and (2) prescribe extensive program reporting requirements that will require the Program Administrator to put in place accounting controls to monitor and analyze program commitments, reservations, obligations, and expenditures. These requirements mandate that the Program Administrator evaluate program outcomes and benefits in relation to the program costs to assess the effectiveness of the program, including utility bill reductions to program participants, ratepayer benefits from the reduction of CARE outlays, environmental benefits, etc.

III. Program Eligibility[16]

Program eligibility is limited to affordable multifamily rental properties. A qualified multifamily affordable multifamily rental property must have five or more rental housing units serving low-income households, that is currently, and continues to be, subject to deed restrictions or other public regulations governing household income levels and rent affordability. We proposed that these affordable restrictions be for a period of 10 years following the receipt of funding from the Multifamily Solar Roofs Program.

Under the specific definition prescribed by AB 693, low-income residential housing means a multifamily residential rental complex financed with low-income housing tax credits, tax-exempt mortgage revenue bonds, general obligation bonds, or local, state, or federal loans or grants in which the rents of the low-income occupants do not exceed those prescribed by deed restrictions or regulatory agreements imposed pursuant to the terms of the public financing or financial assistance.[17] Within this definition, low-income means a household with an income at or below 80% of the area's median income (AMI), which is updated annually for each county by the U.S. Department of Housing and Urban Development (HUD).

Under this definition, AB 693 further divides eligible properties into two categories. A qualified multifamily property either must be located in a Disadvantaged Community as defined by CalEnviroScreen, or must serve a substantially lower household income level, in which 80% of the residents have incomes at or below 60% of AMI.

Profile of Eligible Projects

As of January 2016, there were 6,023 properties with 425,168 units in California that potentially satisfied the AB 693 eligibility requirements. This inventory will gradually increase as new affordable housing properties are constructed under the Low Income Housing Tax Credit (LIHTC) program.

[16] Questions 1,2,3, and 4 of the ALJ's July 8, 2016 Ruling are covered in this section.
[17] AB 693. Section 2870(a)(3). This section references of Section 2852(3)(a)(i) of the Public Utilities Code. See at http://codes.findlaw.com/ca/public-utilities-code/puc-sect-2852.html

Disadvantaged Communities (DACs) – Section 2870(3)(B) requires that DACs must be identified by the California Environmental Protection Agency pursuant to Section 39711 of the Health and Safety Code.

Consistent with this mandate we propose that DAC designations for the AB 693 program be determined through the use of the CalEnviroScreen tool.[18] CalEnviroScreen assesses a comprehensive set of community indicators in calculating scores and provides an objective basis for determining overall community need. We recommend that the CalEnviroScreen tool be used either on a utility jurisdiction by utility jurisdiction basis or on a statewide basis depending on which approach has the broadest eligibility.[19] It appears that by using CalEnvirScreen on a utility jurisdiction basis instead of the current statewide basis may ensure that regional conditions and factors affecting community needs are more precisely weighted and not skewed by statewide average scores and that the number of census tracts by utility jurisdiction might increase. However, before a decision is reached, an analysis should be completed to determine which approach provides the broadest eligibility.

Currently approximately 20% of the affordable multifamily properties in California that meet the eligibility requirements under Section 2852 are located in DACs identified by CalEnviroScreen on a statewide basis. Of properties located within IOU jurisdictions, approximately 30% of the eligible properties are in DACs. Because the inventory of affordable multifamily housing qualified under the Multifamily Solar Roofs Program is almost entirely comprised of properties meeting the requirement that 80% of the residents have incomes at or below 60% of the AMI, the use of CalEnviroScreen will not materially affect the number of qualified multifamily properties under the program. The practical effect of the DAC eligibility criteria is to direct targeted efforts in areas that have special needs. Table 6 provides a summary of the number of eligible properties and units within IOU jurisdictions and DACs by type of housing.

[18] The CalEnviroScreen 2.0 may be found at: http://oehha.ca.gov/ej/ces2.html.
[19] The Commission recently approved this approach of using CalEnviroScreen in SCE's and SDG&E's electric vehicle pilot programs in A.14-10-014 and A.14-04-014. See D.16-01-045, p.138, and D.16-01-023, p.41.

Table 6 – Affordable Multifamily Housing
Compliant with Section 2852[20]

	State		IOU Jurisdictions		DACs within IOUs[21]	
	Properties	*Units*	*Properties*	*Units*	*Properties*	*Units*
LIHTC	4,213	*312,237*	2,932	*225,173*	921	*75,187*
HUD	1,422	*98,812*	918	*63,549*	249	*19,276*
USDA	388	*19,119*	315	*15,214*	91	*4,851*
TOTAL	6,023	*425,168*	4,165	*303,936*	1,261	*99,314*

CEJA and Kevala developed a GIS-based tool identifying eligible multifamily affordable housing properties. This tool is available at: https://keva.la/ceja.

Community Choice Aggregators (CCAs) – Section 2870(i) states that "[t]he commission shall determine the eligibility of qualified multifamily affordable housing property tenants that are customers of community choice aggregators."

We propose that qualified multifamily properties that are CCA customersshould be included in the Multifamily Solar Roofs program. By targeting underserved affordable housing markets and low-income renters, Multifamily Solar Roofs program will address programmatic gaps and compliment other energy programs available in these areas. We further note that the funding source for AB 693[22] was established to provide customers of electrical corporations, including customers in CCAs, with a Climate Credit. We see no justification to exclude low-income residents of CCAs from this program.

Eligibility Determinations

There are several factors that significantly simplify the process for determining eligibility of affordable multifamily rental properties under AB 693. Financial assistance provided to multifamily housing from the public entities listed below directly support the development and

[20] Prepared by the California Housing Partnership Corporation, January 2016. Analysis is based on housing data compiled by CHPC from public agencies with regulatory oversight responsibilities. Data does not include federally-supported public housing properties administered by public housing authorities. These properties would add approximately 350 properties and 37,650 units to the statewide total.
[21] Numbers based on Top 25% of DACs as determined on a statewide basis using CalEnviroScreen.
[22] Subdivision (b) of Section 95890 of Title 17 of the California Code of Regulations.

operation of low-income, very low-income, and extremely low-income rental housing. This assistance is conditioned on state and federally-monitored compliance with annually updated and officially published housing rent and income restrictions.

- California Tax Credit Allocation Committee (TCAC)
- California Debt Limit Allocation Committee (CDLAC)
- California Department of Housing and Community Development (HCD)
- The California Housing Finance Agency (CalHFA)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Department of Agriculture – Rural Development (USDA-RD)
- Redevelopment Agency successor agencies in good standing with HCD
- City or county governments, administering HOME Funds in compliance with HUD regulations.

Multifamily rental housing assistance programs administered by the public agencies listed above satisfy both AB 693's requirement that the property have a deed restriction or regulatory agreement prescribing tenant income and rent levels pursuant the terms of financing or financial assistance[23], and AB 693's requirement applicable to properties located outside of DACs that 80% of renter households have incomes at or below 60% of the area median income.

Several public agencies and non-profit organizations maintain databases of affordable multifamily properties within the State of California that can be made available to the Program Administrator to develop a list of properties eligible for the program. This data could assist the Program Administrator in verifying eligibility and streamlining the eligibility process. A list of qualified LIHTC and HUD-assisted multifamily properties, prepared by the California Housing Partnership Corporation (CHPC) from data provided by the public agencies, is provided in Appendix B and C.

Additionally, affordable multifamily rental properties eligible under AB 693 are subject to strict income reporting and verification requirements. Federal and state housing agencies require property owners to collect and maintain records of tenant household incomes. Where a question exists about whether a multifamily rental property meets a particular income standard, the Program Administrator could use a copy of the current rent roll to verify

[23] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(a)(3). This section references Section 2852(a)(3)(a)(i) of the Public Utilities Code. See at http://codes.findlaw.com/ca/public-utilities-code/puc-sect-2852.html

compliance with the program's eligibility standard without disclosing protected tenant information.

Eligibility Requirements and Documentation

To make eligibility determinations, we recommend that the follow requirements be adopted for the Multifamily Solar Roofs Program:

- *Presumption of Eligibility* – Affordable multifamily properties with a deed restriction or regulatory agreement from one of the agencies listed above should be presumed eligible for the Multifamily Solar Roofs program. We recommend that the Program Administrator develop and annually update a list of prequalified affordable multifamily rental housing properties in consultation state agencies and non-profit housing organizations that maintain data on California's affordable multifamily housing inventory.

- *Requirements for Property Certification of Eligibility* – Affordable multifamily properties on the pre-qualified list should be permitted to submit a certification of eligibility to establish program eligibility signed by the property owner or officer of the affordable housing organization. The certification should minimally provide the following information:
    i. Name and address of the affordable multifamily property.
    ii. Name and contact information for the public agency that is responsible for regulating the property.
    iii. Certification that the property has a deed restriction, regulatory agreement or housing assistance agreement with the listed public agency.
    iv. Certification that the remaining period of affordability on the property is at least 10 years or in instances where the property has less than 10 years remaining on the regulatory agreement, the property owner agrees that the property will extend current rent affordability restrictions at the property for at least 10 years as a condition of receiving incentives under this program.[24]
    v. Certification that tenant incomes at the property meet one of the following income eligibility standards:
        a. Property is located in a DAC and the tenant incomes are at or below 80% of the AMI;
        b. Property is not in a DAC and 80% of the tenants have incomes at or below 60% of the AMI.

- *Properties Funded by Designated Agencies Not on a Pre-Qualification List* – Newly developed properties and other affordable housing properties that have a deed restriction or regulatory agreement from one of the designated public agencies that are not on the

[24] Similar affordability restrictions are set for the California Low Income Weatherization Program for Large Multifamily Projects. The requirements for this program could be used as a model. See: https://camultifamilyenergyefficiency.org.

prequalified list of properties should be permitted to make a request to be added to the prequalified list if they can provide additional supporting documentation. The documentation includes:

i. Copy of each deed restriction, regulatory agreement or housing assistance contract with the listed public agency or agencies.
ii. Requirements for Property Certification of Eligibility (listed above).

- *Properties Not Funded By Designated Public Agencies* – Affordable housing properties that have a deed restriction or regulatory agreement from a public entity other than the designated agencies should be permitted to make a request to be added to the list if they can provide supporting documentation including:
    i. Letter from the public entity or nonprofit organization with regulatory oversight responsibilities that includes information on the rent restriction and other affordability terms and conditions on the property pursuant to the terms of the financing or financial assistance.
    ii. Copy of each deed restriction, regulatory agreement or housing assistance contract with the listed public agency or agencies.
    iii. Requirements for Property Certification of Eligibility (listed above).

IV. Geographic Program Targeting[25]

The Multifamily Solar Roofs program was intended to be broadly available to all qualified affordable multifamily rental properties. The specific legislative direction in AB 693 requires that resources be allocated "to install those systems in a manner that represents the geographic diversity of the state."[26] This requirement precludes a first-come first-serve approach, and calls instead for allocations to be made using a broad set of geographically-based considerations including how resources are distributed between qualified multifamily properties that are located in DACs and qualified properties that are located outside DACs.

While AB 693 does not prescribe a requirement that the Multifamily Solar Roofs Program adopt funding allocations or specific MW capacity targets based on whether a property is located in a DAC or outside of a DAC, we recommend geographic program targets based on funding allocations. An equitable distribution of funding between these DAC and non-DAC properties will further the legislative goal to install qualified systems "in a manner that represents the geographic diversity of the state."[27]

Under AB 693, setting geographic program targets based on funding levels is more logical than a MW based target because of the uncertainty around the amount of annual auction proceeds, the need for dollars before installations and MW can be realized, and because the actual *investment spending* in each community is directly correlated with things like job training, job placement, and other economic development opportunities.

DAC Funding Target

Under the approach proposed above, we specifically recommend that funding targets be set based on the percentage of eligible properties that are located in CalEnviroScreen DACs and percent of qualified properties located outside of CalEnviroScreen DACs. In this regard, as shown in Table 6, the number of qualified multifamily properties in DACs is approximately 30% of the total qualified multifamily properties in IOU jurisdictions as defined on a statewide basis using the CalEnviroScreen tool (see table 6). Assuming CalEnviroScreen is used on a statewide

[25] Questions 5, and 6 and 23 of the ALJ's July 8, 2016 Ruling are covered in this section.
[26] AB 693. Section 1.(e)
[27] AB 693 Section 1(e).

basis for the Multifamily Solar Roofs Program, we proposed that 30% of the program's funding on an annual basis be allocated for use in DACs. If CalEnviroScreen is used by IOU service territory or some combination of service territory or statewide, then the Commission would need to calculate the new percentages of DAC-eligible buildings and adjust the funding allocation accordingly.

Flexibility in Managing Target

To successfully implement the Multifamily Solar Roofs Program, the Program Administrator (PA) should have flexibility during a funding year to move funds from an undersubscribed allocation category to an oversubscribed category to ensure that program implementation is not bottlenecked and solar projects are being installed in a timely and efficient manner. However, before moving funds from DAC allocations for the benefit of properties located outside of DACs, the PA should be required to provide additional outreach and technical support to undersubscribed areas to ensure that properties within these areas have access to the program funding that is available. Additionally, we recommend that the PA be required to file an advice letter before shifting funds to ensure that stakeholders have the opportunity to comment on the proposed transfer.

Any transfer that is authorized should not exceed the total demand for incentive dollars needed by the other bucket, and when applications are received in the undersubscribed bucket, those applications should be prioritized in an attempt to preserve the original allocation as much as possible. To ensure that funding targets are met for DACs, the Program Administrator should be required to make adjustments in future program year allocations to ensure that over the course of the program the funding allocation targets for DACs are meet.

Other Geographic Diversity Considerations

In addition to allocating incentive dollars according to DAC and non-DAC designations, The Program Administrator should track reservations and installations to ensure geographic diversity throughout California. AB 693 aims to install qualified systems "in a manner that

represents the geographic diversity of the state."[28] Accordingly the distribution of solar installations and funding commitments is also important in terms of whether the project is in urban, suburban, and rural communities.

While we do not recommend specific funding or MW targets based on these or other geographic designations, we recommend that the Program Administrator make efforts to ensure that low-income multifamily building owners and tenants in all geographic settings benefit from going solar. This approach could be similar to what occurs in the SASH program and the efforts made to ensure that all counties within the state benefit from program investments.

Resource Allocation Plan and Goals

To implement the proposed targets, we recommend that the Program Administrator prepare a Resource Allocation Plan and set an annual funding targets DACs and non-DAC that is based on available funding and assessment of solar market potential and demands, as well general consideration for achieving broader statewide geographic diversity objectives.

We propose that the Resource Allocation Plan should be developed and updated annually in consultation with environmental justice and other community-based organizations to develop priorities and strategies for meeting geographic diversity goals and objectives. The goal of the plan should be to develop general criteria and guidelines for allocating resources and should identify additional actions necessary to address solar access barriers. Additional actions for DACs should minimally include enhanced community engagement, tenant and property owner education on solar benefits, and technical support for project implementation. Annual updates to Resource Allocation Plans should adjust allocation priorities and outreach efforts to ensure that geographic diversity goals and objectives are achieved throughout the duration of the program.

In tracking program allocations, we recommend that the Program Administrator adopt metrics to help guide outreach and technical support activities including:

i. Number of solar installations *(Projects reserved and Installed).*

[28] AB 693 Section 1(e).

ii. Number of low-income renters receiving solar benefits *(Projects reserved and Installed).*
iii. Number of CARE eligible customers reached by program *(Projects reserved and Installed).*
iv. Amount of PV generation allocated to offset tenant usage *(Projects reserved and Installed).*
v. Number of local hires from solar projects.

Counting Towards AB 327 Compliance

AB 693 provides that the Multifamily Solar Roofs program "may count toward the satisfaction of the commission's obligation to ensure that specific alternatives designed for growth among residential customers in disadvantaged communities…"[29]

The qualified properties under AB 693 represent a very small segment of the residential markets within DACs. Energy Division staff have reported that there are nine (9) million people residing in top 25% of impacted communities and that on average, 54% of the total population DACs are low-income[30] In contrast, there are fewer than 100,000 households residing in AB 693-qualified multifamily households in DACs within IOU jurisdictions.

If AB 693 adoption rates counted towards the special efforts under AB 327 it could skew the specific alternatives adopted pursuant to AB 327 to a narrow segment of the residential market in DACs. This is because AB 327 will likely target other market segments (e.g., single-family homeowners or renters, multifamily buildings that are less than 5 units). This result would be contrary to the intent of AB 327. And we therefore strongly recommend against counting AB 693 results towards AB 327 implementation goals.

Several parties have expressed a desire to target different market segments for the purposes of AB 327 since AB 693 is already targeted low-income multifamily tenants, and other programs with similar qualifying criteria could leave out market segments not targeted by AB

[29] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(b)(1).
[30] Energy Division Staff Paper Presenting Proposals for Alternatives to the NEM Successor Tariff or Contract for Residential Customers in Disadvantaged Communities in Compliance with AB 327, June 3 2015. Low-income is defined as at or below 200% of the Federal Poverty Level, which corresponds with the income eligibility requirements of CARE.

693, be duplicative, and administratively burdensome.[31] We recommend that the different residental market segments are considered separately in tracking solar adoption rates. For example, installations under the AB 693 program should not count towards AB 327 obligations if the specific alternative adopted pursuant to AB 327 targets single-family home owner or renters or low-income multifamily buildings with less than five units. This will ensure that AB 693 does not swallow up the 327 program in contravention to the mandate of both AB 327 and AB 693.

[31] See, e.g., Greenlining Opening Comments on ALJ Ruling Seeking Comment on AB 693 pp. 5-6 (Nov. 2, 2015); GRID Opening Comments on ALJ Ruling Seeking Comment on AB 693 pp. 4-9 (Nov. 2, 2015); MASH Coal. Opening Comments on ALJ Ruling Seeking Comment on AB 693 pp. 2-6 (Nov. 2, 2015).

V. Tenant Allocations[32]

AB 693 states that:

> The commission shall require that the electricity generated by qualifying renewable energy systems installed pursuant to the program be primarily used to offset electricity usage by low-income tenants. These requirements may include required covenants and restrictions in deeds.[33]

A priority of the Multifamily Solar Roofs program is for a majority of the generation from the solar energy system to offset electricity used and paid for by tenants. Compliance with this mandate can be accomplished by establishing design requirements for the solar energy systems supported by the program and does not require additional covenants or deed restrictions. The appropriate design of qualified solar energy systems at affordable housing properties must consider a number of factors that limit system sizing, and also balance the need to offset electricity use for both residential units and common areas to make the solar installation financial feasible for the property owner. We recommend that the design of the solar energy system consider the key factors listed below.

Tenant Electricity Usage

Designing a PV system at a multifamily property based on tenant usage can be complicated. Usage varies widely across units and to date access to tenant utility data has been limited. Caution is necessary to prevent system over-sizing to minimize financial risks to property owners.

California electricity usage is among the lowest per capita in the country. The California Public Utilities Commission (CPUC) reports that California's average residential electricity usage was 542 kilowatt-hour (kWh) per month in 2014, and was 519 kWh per month in 2015.[34] This finding is consistent with a report prepared by Evergreen Economics for the Energy Savings

[32] Questions 13 and 14 of the ALJ's July 8, 2016 Ruling are covered in this section.
[33] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(2).
[34] Reagan R. Rockzsfforde and Marzia Zafar, Geospatial Analysis of California's Utility Services, California Public Utilities Commission, May 23, 2016.

Assistance (ESA) and California Alternative Rate for Energy (CARE) programs, which reported that CARE customers in 2012 had an average electricity usage of 547 kWh per month.[35]

In estimating tenant electricity usage in multifamily rental buildings it should be noted that the data in the referenced reports includes residential households in both multifamily and single family housing and therefore likely overstate household electricity use in multifamily rental buildings. There are several intuitive reasons why single family homes would have greater plug load and lighting use. Single family homes are larger than affordable multifamily units, have more physical space for more devices, and more occupants consuming energy services. Occupants in single family buildings also tend to have more household income to spend on increased amenities, such as additional devices or devices with premium features.

Further analysis is needed to estimate the multifamily electricity use once data is available from utility companies. To set a benchmark for the purposes of this proposal we estimated that per unit multifamily electricity use is on average 70% to 80% of the average residential usage in the state, or approximately 4,200 kWh to 4,800 kWh annually.[36] Assuming that 2kW of PV capacity is provided on average to each unit, the PV generation could offset 60% to 70% of each unit's electricity use.

Sizing of PV systems at multifamily properties must also consider wide differences in energy use among tenants at a multifamily site. The differences are illustrated in the chart below, which was contained in report prepared by Redwood Energy evaluating the accuracy of energy modeling for apartment complexes.[37]

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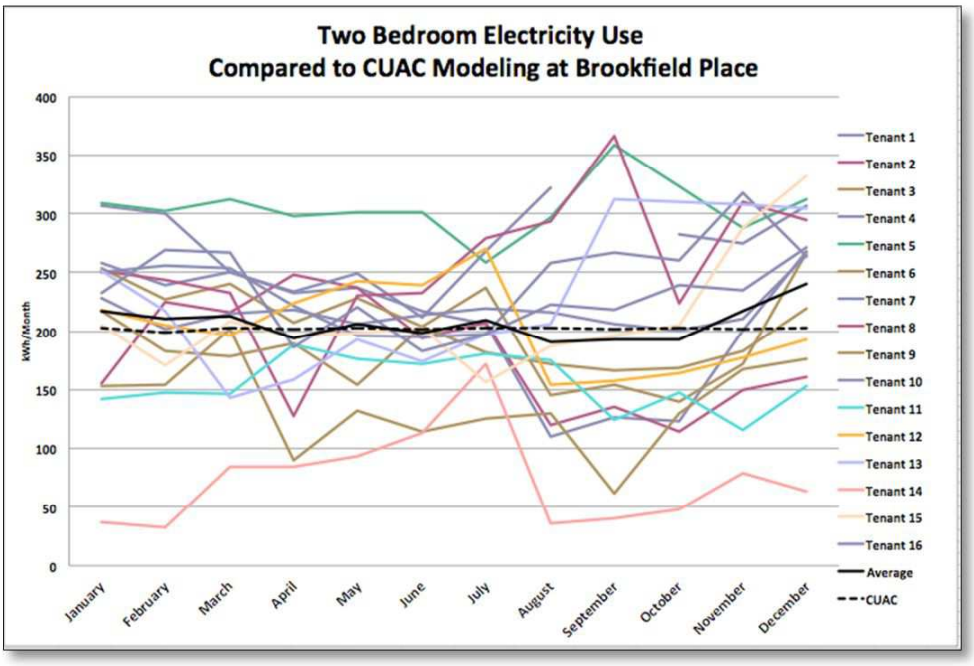
[35] Evergreen Economics, Needs Assessment for the Energy Savings Assistance and the California Alternate Rates for Energy Programs Volume 1: Summary Report, Final Report, December 16, 2013. Prepared for Southern California Edison, Pacific Gas and Electric, Southern California Gas, San Diego Gas and Electric and the California Public
Utilities Commission.

[36] This estimate is generally consistent kWh usage seen in the large Multifamily Low Income Weatherization Program. The Association for Energy Affordability (AEA) has developed a tenant kWh load estimation tool using the 2009 Residential Appliance Saturation Study (RASS). The RASS The study yielded energy consumption estimates for 27 electric and 10 natural gas residential end-uses and appliance saturations for households.

[37] Redwood Energy, Is the Modeling Produced by the California Utility Allowance Calculator Accurate? A Study of Seven Apartment Complexes, September 15, 2013.



The chart above reinforces that in implementing the Multifamily Solar Roofs Program caution should be taken to ensure that PV installations are not designed to offset 100% of the aggregated tenant use at a multifamily property. Doing this would result in some tenants being allocated more credits than they could use during a year. Because all of the credits generated cannot be used to offset electricity use, the cost-effectiveness and economics of the investment is reduced. Based on the variations seen in the analysis conducted by Redwood Energy, we recommend that offsets to aggregated tenant loads be capped at 70% pending further analysis to determine more precise PV scaling criteria for PV systems in multifamily buildings. In this regard, energy data sharing requirements under AB 802 can assist property owners in normalizing tenant electricity usage to prevent system over-sizing.

Utility Tariffs

The economics of solar energy systems are also affected by utility tariffs. PV systems serving common areas have greater grid parity than low-income rental units because of significant differences in the utility rate structure. Additionally, as Time-of-Use (TOU) tariffs are adopted with later peak periods, the underlying economics of stand-alone PV systems is adversely affected. In these circumstances, more integrated energy strategies that combine

energy efficiency and energy storage with solar installation are necessary to ensure that the investment remains cost effective and preserves and enhances the value of the investment to the tenants and property owners. The changing economics of the solar energy system is addressed in more detail in the proposal's discussion of solar energy systems in Section XI. These economics considerations should be reflected in the design of the solar system.

Common Areas at Qualified Multifamily Properties

Qualified multifamily properties have both residential units and common areas that are used by residents. Common areas include reception areas, multi-purpose rooms, laundries, hallways, elevators, stairways, and parking area. While the legislation's clear focus is on the electricity usage within residential units, AB 693 does not exclude coverage of other building areas used by tenants. Moreover, because participation in the program is at the election of the owners of affordable housing properties, who typically are most motivated by the prospect of reducing electrical costs for owner-metered areas, coverage of common areas cannot be excluded without materially and adversely affecting program participation. Reducing electrical costs in common areas of rent-restricted affordable housing also has the ancillary benefit of reducing operating costs and therefore the need to increase rents over time. In summary, we recommend that the Multifamily Solar Roofs Program provide sufficient flexibility to offset common area electricity usage for owners to participate in the program.

Master-Metered Properties

The requirements enacted by AB 693 do not specifically exclude master metered properties. Indeed, AB 693 only requires that solar system be "primarily used to offset electricity usage by low-income tenants" and not entirely offset tenant usage.[38] The program's stated priority of offsetting tenant electricity usage is fulfilled whether or not the electricity is directly metered to the tenant or provided to the tenant by the property owner.

[38] Cal. Pub. Res. Code § 2870(f)(2) (emphasis added); See also Cal. Pub. Res. Code § 2870(g) (stating the requirement for when tenants participate via VNEM in a separate section of the bill, indicating that that there are two requirements under the bill: one for when the common areas are served – that the system primarily offset tenant load - and another describing the bill reductions and direct economic benefits the tenants receiving the primary offset must receive).

Excluding master-metered properties would be detrimental to low-income renters. In the context of California's affordable multifamily inventory, master metered properties typically include older buildings, which have higher energy use, and buildings that provide housing for special needs or at risk housing populations such as the elderly, persons with disabilities, single-room occupancy housing, and transitional housing for the homeless. These properties are highly vulnerable to utility cost increases, which can adversely affect the property's financial stability and affordability. Excluding these properties would run counter to AB 693's express purpose of providing assistance to low-income customers to make sure they can afford to pay their energy bills, reducing energy bills for CARE customers, and making solar systems more accessible to low-income and disadvantaged communities.[39]

Additionally, for master-metered buildings, the installation of solar energy systems to offset electricity used by tenant is an important strategy for making operating funds available to provide tenant services, make building improvements, and preserve affordable housing options for vulnerable at-risk populations. We view these outcomes as tenant benefits under AB 693. This is especially important for non-profit housing organizations, which are subject to added restrictions requiring property income to be used for tenant services and building improvements.

While we do not have a precise count of affordable multifamily rental properties that are master-metered because of database limitations, we estimate that approximately 20% of the affordable housing inventory is master-metered for the electricity used by low-income tenants. The Commission should not exclude this significant portion of the low-income multifamily market and its vulnerable tenants in need of the benefits of going solar.

Criteria for Criteria Designing Solar PV Systems and Sizing Incentives

To address the issues discussed above, we recommend that the Multifamily Solar Roofs Program set criteria for the design of solar systems that are supported through the program's incentive structure. Specifically, we recommend that the following criteria be adopted to ensure that solar energy systems are properly sized and that incentives are appropriately

[39] See AB 693 Section 1(a), (b), & (e).

targeted to solar energy systems that offset electricity used by or paid for by low-income renters, while providing flexibility to address site conditions that limit the ability of the property owner to adequately serve both residents and common areas, and circumstance that affect the financial feasibility of the solar installation:

- *Balanced Solar Design:* The design of the solar systems should balance the needs of both the residents and property owners to ensure the project's financial feasibility as well as the owner's motivation to participate in the program.
- *PV Allocation*: At least 51% of the electricity generation should be allocated to residential units unless site conditions limit the sizing of the PV system.
- *Tenant Area Service:* Solar energy systems serving residential units should be limited to 70% or less of the aggregated tenant electrical usage at the qualified multifamily site to prevent system over sizing, and should factor in reductions to consumption from energy efficiency improvements and benefits accrued through storage devices when applicable.
- *Common Area Service*: Solar energy systems serving property common areas may offset up to 100 percent of common area electrical demands after considering tenant offsets and factoring in energy efficiency improvements.
- *Master Metered Buildings*: Master-metered buildings may participate in the program on the condition that energy savings from the installed solar energy systems be used to pay for support services provided to tenants, energy efficiency improvements in residential units, or other building improvements benefiting tenants.
- *Properties with Site Limitations*: Properties with site conditions limiting the ability to serve both residential units and common areas may increase the allocation of PV generation to offset common area use to the extent needed to ensure that the solar energy installation is financially feasible.
- *Allocations to Tenants and Other Qualified Multifamily Sites:* PV generation from a solar energy system installed at a qualified multifamily site may be allocated to low-income tenants at another qualified multifamily property that is owned by the same nonprofit housing organization and within the same utility jurisdiction.

Documentation and Verification of Allocation

Allocations for solar energy systems and updates to system design and allocations should be submitted to the Program Administrator as part of the application, reservation, and payment process. Minimally, the documentation should provide:

- PV system size and design detail (number of modules, inverters, annual kWh, etc.).
- PV allocations for tenant residential units and for common areas (annual kWh and percent of total).
- PV offsets for tenant residential units and for common areas (annual kWh and percent of total).
- Number of units at property and number receiving a direct PV allocation.

- PV allocations by unit type or size (annual kWh and percent of allocation by unit type).
- Other offsets provided to tenant residential units and for common areas from energy efficiency and energy storage systems (annual kWh and/or annual kW).
- Explanation of site condition affecting solar energy system allocations.
- Explanation if less than 100% of the units receive allocations from the solar energy system.

The Program Administrator should conduct periodic reviews to verify that the electricity generated by incentivized systems is offsetting electricity usage of low-income tenants. This can be accomplished as part of the energy benchmarking required under AB 802, which reflects utility data provided by utility companies on the energy usage and solar allocations recorded on utility meters at the property. We recommend that the property owner can be required to provide reports from energy benchmarking systems to the Program Administration for a prescribed period following the installation of a solar energy system. Should further analysis be required, the Program Administrator could request utility data from the respective utility companies or conduct selected site audits of utility billing records to verify compliance.

VI. Tenant Benefits[40]

Under the Multifamily Solar Roofs Program, the economic benefits from the electricity allocated to tenants from a solar energy system installed at a qualified affordable multifamily rental property must be provided to tenants residing at a qualified multifamily property as a credit on their utility bills.[41] In this regard, AB 693 provides that:

> The commission shall ensure that utility bill reductions are achieved through tariffs that allow for the allocation of credits, such as virtual net metering tariffs designed for Multifamily Affordable Solar Housing Program participants, or other tariffs that may be adopted by the commission pursuant to Section 2827.1.[42]

Virtual Net Metering

Multifamily individually metered renter households are a challenging segment for solar PV adoption due to the problem of distributing the benefits of system output among individually metered occupants. To address this issue, the CPUC directed the IOUs to file tariffs for Virtual Net Energy Metering (VNEM).[43] The specific intent of VNEM was to help low-income residents receive direct benefits from a solar system installed at a multifamily property. Based on the merits of these tariffs, the CPUC expanded VNEM to all multi-tenant, multi-meter properties in 2011 and included all NEM-eligible technologies for eligibility.[44] The CPUC reports that as of the end of 2015 there were over 274 (*non-MASH*) VNEM projects using a VNEM tariff with a combined capacity of 8.1 MW.[45] Given that VNEM is a well-established and successful mechanism for distributing the benefits of system output among individually metered occupants, we recommend that VNEM tariffs be used for the Multifamily Solar Roofs Program with modifications to address the following issues:

- *Effect of Non-Bypassable Charges and Design of TOU Rate Structures* – The CPUC final decision in the NEM 2.0 proceeding requires that NEM successor customers pay for

[40] Questions 13 and 14 of the ALJ's July 8, 2016 Ruling are covered in this section.
[41] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(g)(1) states, "low-income tenants who participate in the program shall receive credits on utility bills from the program."
[42] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(g)(1).
[43] D.08-10-036
[44] California Solar Initiative Annual Program Assessment, June 2016. California Public Utilities Commission.
[45] Ibid.

Non-Bypassable Charges (NBC) on all energy consumed from the grid. NBCs are used to support low-income energy services and program. We generally support the use of NBC in the program, but requests that the Commission consider impacts of NBCs in the design of TOU tariffs for low-income tenants. NBC's would equate to an added two cents or more per kWh. For a low-income household on CARE, NBCs would add 15% to 20% to a CARE household's utility bill. Coupled with a requirement to convert to TOU rates, and new utility rate structures that move peak periods to evening hours, the added charges and utility costs will substantially diminish the financial benefits of the program. Accordingly, we recommend that the VNEM tariffs incorporate TOU rate structures that do not adversely affect the economic benefits that would otherwise be received by tenants.

- Tenant Aggregation at Qualified Multifamily Sites – The tariff rate design for the Multifamily Solar Roofs program should also recognize that mid-rise and high-rise multifamily dwellings are not well aligned with the objective of scaling PV systems to offset tenant electricity loads because of roof space limitations and other site conditions. These conditions primarily affect properties located in denser more urban areas and new infill developments located along transit corridors, which are supported by investments from other Cap and Trade programs. To provide solar access to low-income tenants in these properties a tariff structure is needed to permit the generation from solar energy systems at a qualified multifamily site to be shared with low-income tenants residing at other qualified multifamily properties that are unable to provide solar to tenants because of site constraints.

  We recommend that nonprofit controlled affordable multifamily property owners with multiple qualified properties in their inventories be permitted use AB 693 incentives to develop solar installations at one or more qualified multifamily sites that are scaled to serve low-income tenants residing at other qualified multifamily sites owned by the same nonprofit controlled housing organization and within the same utility territory.

  Under this approach, which is similar to tariffs adopted in Massachusetts[46] and permissible under California law[47], the property owner would provide written notice to

[46] See Massachusetts Green Communities Act. Can be viewed at https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter169

[47] AB 693 only requires that the "qualifying solar energy system" be installed on eligible properties, and that those systems "primarily … offset electricity by low-income tenants [of eligible buildings]." See Cal. Pub. Res. Code § 2870(a)(3) & (4), (f)(1) & (2). In turn, AB 693 defines "solar energy system" by the criteria in Cal. Pub. Res. Code section 25782, which requires in relevant part: (1) The solar energy system is intended primarily to offset *part* or all of the consumer's own electricity demand; and (2) The solar energy system is located on the same premises of the end-use consumer where the consumer's *own* electricity demand is located. Cal. Pub. Res. Code § 25782(2), (5) (emphasis added). These sections therefore only require that the building owner's own usage, the common area meter(s) connected to the solar system, need to be partially offset. The tenants would not have to be onsite, however, because tenants would always receive bill credits via VNEM on individually metered properties. In other words,

the Program Administrator and utilities of the other qualified multifamily properties that would be served by the system, the meter information for the tenants at the secondary sites, and designate the amounts of the credits allocated to such customers similar to what is required under VNEM.

- Tenant Contributions for Solar O&M – To the extent that the program incentives and energy savings from common areas are not available or sufficient to cover ongoing operation and maintenance (O&M) costs for the solar energy system inclusive of equipment replacement, a mechanism is required to facilitate the collection of contributions from tenants so that the O&M costs of the solar energy system can be covered.

  Accordingly, we recommend that an O&M charge be incorporate in the VNEM tariff, and included on monthly utility bills along with the solar offsets and credits provided to the customer. The charge should reflect a per kWh estimate basis of reasonable and ordinary O&M costs and be billed on a per kWh basis based on the number of kWh offsets allocated to the tenant. The allowable O&M charges should not exceed two cents per kWh[48] or exceed 20% of the offsets, to ensure that tenants receive a direct economic benefit.

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if the building owner is offsetting part of the common area load and the system is located on the eligible building where this offset is occurring, it meets the criteria of 25782(2) and (5). In addition, AB 693 only states that the system must primarily offset tenant load, but does not specify that those tenants must live in the same building where the system is sited. See Cal. Pub. Res. Code § 2870(f)(2). Moreover, AB 693 permits a VNEM tariff "such as virtual net metering tariffs designed for Multifamily Affordable Solar Housing Program participants or other tariffs that may be adopted by the commission pursuant to Section 2827.1." Cal. Pub. Res. Code § 2870(g)(1). Accordingly, the VNEM tariff need not be identical to the MASH VNEM tariff, which limits credits to onsite tenants, because the VNEM tariff could be developed in the "disadvantaged communities" portion of AB 327. Furthermore, although not adopted by the Commission in Phase I, the Joint Solar Parties and the Energy Division Staff proposed varying versions of expanded VNEM that would allow the allocation of bill credits to offsite tenants within the same IOU service territory and with the same census tract in the same IOU service territory, respectively. See Administrative Law Judge's Ruling Accepting Into the Record Energy Division Staff Papers on the AB 327 Successor Tariff or Contract, Attachment 2: Energy Division Staff Disadvantaged Communities Proposal for AB 327, p. 2-12 (June 4, 2015); Joint Solar Parties Proposal, p. v (Aug. 3, 2015). These proposals are still under consideration and as such, the Commission should not foreclose the possibility that AB 693 could include an expanded VNEM tariff that would allow off-site eligible low-income tenants to receive VNEM credits from a system located on another building owned by the same building owner. This tariff would be similar to net energy metering aggregation, although the properties would not need to be contiguous.

[48] Current O&M charges are estimated at $0.02/kWh. The collection of O&M charges would be provided to property owner and retained in a reserve account for scheduled maintenance and equipment replacement.

Utility Allowances

There is considerable confusion regarding utility allowances in the various AB 693-eligible affordable housing programs and whether applicable utility allowance policies and guidelines can operate to reduce or eliminate prescribed solar benefits to low-income tenants. In affordable housing, the total amount of regulated rent paid by tenants includes both housing costs and a reasonable amount of utilities. Where the tenant pays utility costs directly to the utility provider, owners must provide a utility allowance to credit tenants for a reasonable estimate of those costs. The utility allowance is not equal to the actual costs paid by each tenant. These allowances vary by unit size, and depend on the rules applicable to each program. Utility allowances are updated periodically, usually annually. Over time, if utility allowances are increased to reflect increased utility costs, such as rate increases, the amount of the tenant rent paid to the owner decreases by the same dollar amount. Conversely, if the utility allowance is decreased for any reason, possibly including reduced electricity costs from a solar installation, the amount of the tenant's rent payment to the owner may increase. Whether reduced electricity costs due to solar must or could trigger changes in the utility allowances at a specific affordable property depends on the type of utility allowance methodology being used under applicable program rules, and whether that methodology can be changed by the owner.

For most AB 693-eligible affordable housing properties, utility allowances are determined in either of two ways, using: (1) "project-specific" methodologies, such as actual consumption billing data or energy modeling at the specific property; or (2) a schedule, usually provided by the local Public Housing Authority (PHA), which is based upon community-wide data that reflects utility consumption in the overall housing stock. Generally, properties that have rental assistance under a HUD or Rural Development (RD) program (e.g., project-based Section 8 or RD Rental Assistance) must use a project-specific methodology, usually actual consumption data. This category includes those Low-Income Housing Tax Credit properties that also have HUD or RD Rental Assistance. Most affordable properties supported by LIHTC or Project-Based Vouchers use a PHA schedule, although a small number of LIHTC properties

developed since 2009 have elected to establish a project-specific allowance using a TCAC-approved energy consumption model, the California Utility Allowance Calculator (CUAC).

In the MASH program, adjusting utility allowances was seen as part of that program's financing strategy for LIHTC properties. Under that program, because incentive levels were not sufficient to cover the costs of solar installations serving low-income tenants, the MASH program explicitly permitted property owners to adjust (lower) utility allowances through a special process created by the California Tax Credit Allocation Committee (TCAC) for recipients of MASH funding. This restricted process requires MASH projects seeking utility allowance adjustments to undergo an analysis using the California Utility Allowance Calculator (CUAC) to set the adjustment level. The adjustments would increase the tenant's rent payment to the property and thereby increase the cash flow to the property owners to support improvement costs (or increase the property's Net Operating Income).

This approach proved unsuccessful for a number of reasons,[49] and since the MASH 2.0program was launched nearly a year ago, TCAC has processed relatively few utility allowances adjustments.[50] Moreover, utility allowance adjustments to accommodate solar are not possible for HUD-assisted or USDA Rural Development (USDA-RD) properties under the MASH program. These agencies have no clear policy on whether or how allowances can or should be adjusted to account for MASH-required direct tenant benefits, and on how any subsidy savings to the agency from any allowance reductions that might occur can be shared with owners to cover gaps in financing installations.

Under the requirements set by AB 693, in contrast to MASH 2.0, all of the solar generation allocated to tenants is intended to provide direct offsets providing economic benefits to the tenants. Further, under AB 693, "the commission shall ensure that electrical corporation tariff structures affecting the low-income tenants participating in the program

[49] Problems encountered included the absence of project-specific methodologies capable of providing shared savings to both tenants and owners (in the case of HUD properties), inconsistent Public Housing Authority utility allowance schedules resulting in lower adjustments from solar, public policies requiring the use of different utility tariffs in calculating utility allowances resulting in cost increases to baseline utility cost estimates, the cost and complexity of CUAC administration, and modeling uncertainties.

[50] According to the California Tax Credit Allocation Commission, there are currently up to 20 projects undertaking utility allowance reviews using the CUAC, and as of June 2016 only one existing LIHTC property installing a MASH 2.0 solar project received approval for a utility allowance adjustment.

continue to provide a direct economic benefit from the qualifying solar energy system."[51] As such, the CPUC should carefully evaluate the effect of utility allowance policies to determine whether or not such policies or practices would affect the actual economic benefits received by low-income tenant households.

Our preliminary assessment is that AB 693's tenant benefit requirement will not be materially impacted for the vast majority of qualified multifamily properties:

- **LIHTC properties** – LIHTC properties comprise 70% of the eligible multifamily property inventory. For these properties, owners typically set utility allowances using PHA utility allowance schedules. Because the PHA schedule is based on a community standard, the solar credits received by the tenant household would not affect the amount of the utility allowance. The other method available to LIHTC properties placed in service since 2009 is the California Utility Allowance Calculator (CUAC). Under this method the solar production allocated to tenants can be removed from the calculation, so that the resulting project-specific allowance is unaffected by PV offsets for tenant loads. Additionally, for solar installations funded under AB 693, his method would be available only for new construction projects. Existing LIHTC properties participating in the Multifamily Solar Roofs program are not able to use the CUAC under TCAC's current policies. In summary, for LIHTC properties without HUD or RD rental assistance, the benefits provided to low-income tenants will not be adversely affected by federal housing policies and these benefits are currently safeguarded from recapture. To ensure that property owners using the CUAC do not inadvertently take solar credits intended for the sole benefit of the tenants, the Commission could require that solar credits be removed from utility allowance calculations.

- **HUD-assisted properties** – HUD-assisted properties comprise approximately 22% of the eligible inventory. Those HUD-assisted AB 693-eligible properties must use a project-specific actual consumption methodology to calculate utility allowances under HUD Multifamily Notice, H-2015-04.[52] This methodology currently presents a potential conflict with AB 693's tenant benefit requirements. Under this Notice, absent further modification, tenant benefits will be considered utility cost reductions driving commensurate reductions in utility allowances and increases in tenant rent contributions to owners. By reducing subsidy payments, and preventing owners from accessing the savings if needed, HUD will capture all of the AB 693-required tenant benefits from reduced electricity bills from low-income renters, in effect making HUD the beneficiary of the state's investment and this program's energy savings. HUD's guidelines were established through an informal internal process (issuing a Notice), not through formal notice-and-comment rulemaking. Thus, HUD apparently has considerable discretion in setting methodologies or other guidelines for calculating

[51] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(g)(2).
[52] HUD Notice H-2015-04, Methodology for Completing a Multifamily Housing Utility Analysis, June 22, 2015.

utility allowances for privately owned HUD-assisted properties. HUD could still establish revised guidelines to require owners to disregard the AB 693 solar offset or credit it back to tenants in their utility allowance calculations. HUD has been advised of this potential conflict, and on April 6, 2016 CHPC provided HUD an issue paper with specific recommendation to largely protect tenant benefits.

In summary, solutions within the discretion of the federal agency exist to resolve this conflict over HUD's capture of intended tenant benefits. Should HUD provide information to the contrary, the Commission can consider whether to adjust the program's tenant benefit requirements to accommodate HUD properties. In this regard, it should be noted that no such accommodation was provided for the MASH 2 program. Should an accommodation for the Multifamily Solar Roofs Program be considered, since HUD would be the primary beneficiary of the solar installations funded by the State of California, the Commission should consider what level of financial contribution is appropriate from HUD or HUD property owners to reduce the level of state incentives commensurate with the reduction in benefits provided to California renters.

- **Actions Required to Safeguard Tenant Benefits from Utility Allowance Recapture –** To ensure that publically regulated utility allowance polices do not conflict with AB 693's tenant benefit provisions, we recommend the CPUC and the Program Administrator take the following steps:
    i. Require owner certifications that a utility allowance reduction or increase in tenant rent payment will not be undertaken as a result of the installation of the solar energy system.
    ii. The Commission should effectuate state policy by advocating that HUD, USDA-RD and other state, federal, and local agencies not count the directed tenant benefits as income in determining the tenant's rent contribution.
    iii. The Program Administrator should conduct periodic monitoring and verification of housing types with known utility allowance policy conflicts to ensure that utility allowances are not reduced as a result of the solar energy system funded under AB 693.
    iv. Ensure that if utility allowance reductions are allowed by the Commission as a result of the installation of a solar energy system funded under AB 693, there is a corresponding decrease in the level of incentives paid.

Documentation and Verification of Tenant Benefits

AB 693 requires that:

> "The commission shall ensure that electrical corporation tariff structures affecting the low-income tenants participating in the program continue to provide a direct economic benefit from the qualifying solar energy system."[53]

To implement tenant benefit requirements for the Multifamily Solar Roofs Program we recommend that the Commission require:

- *Affidavit of Compliance with Tenant Benefit Requirements* – Property owners must certify that they will not undertake a utility allowance reduction or increase to tenant rent payments as a result of the installation of the solar energy system during the ten-year period following installation.

- *Program Administrator Due Diligence* – The Program Administrator must conduct reasonable due diligence to determine that tenants will receive and continue to receive a direct benefit under the program. The due diligence should include assessments of:
    i. Solar PV offset provided to tenants
    ii. Added costs paid by tenants for additional charges or fees or utility rate changes resulting from the installation of a solar energy system at the property
    iii. Net economic benefit received by the low-income tenants

- *Transparency* –As benefit recipients, tenants should be allowed to verify that promised tenant benefits are actually delivered. Calculations of tenant benefits and supporting documents for the property should be made available to tenants or their representatives.

[53] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(g)(2).

VII. Solar Financing and Ownership Structures[54]

In general, affordable housing property owners and tenants prefer PV system ownership to Third Party Owner (TPO) transactions. Purchasing options provide lower long-term kWh costs and greater financial benefits to property owners and tenants, even with financing costs, and pose less out-year financial risk in comparison to TPO agreements that may contain cost escalators to bolster investor returns. However to accomplish system ownership objectives property owners require either deeper incentives or off-book project financial tools, such as on-bill financing, to cover costs.

TPOs can offer important options where property financing or off-book financing options are not available to cover solar project costs. Owners of rent restricted affordable multifamily housing need **one-stop** alternatives that provide access to financing with no front-end costs. Large solar companies with financing and investment funds capable of delivering integrated solar services typically provide these options. These options may be less available for smaller solar companies to participate in this program.

A number of affordable housing organizations have sought to develop their own investment entities to enable portfolio financing of solar projects, but these structures are complex and costly to develop, and further assistance is need to bring this mechanisms on line. In either type of transaction – property purchase or TPO – affordable housing owners seek sufficient upfront resources to minimize the cost of the solar investment to the property, increase the value of the investment, and minimize financial risk. Because the benefits from resident-serving solar energy systems must be retained by the low-income beneficiaries of the program, property owners generally require that the cost of solar energy systems serving residential units either be fully funded from incentives and any other resource that can be reasonably leveraged.

Additionally, property owners are concerned about how operations and maintenance (O&M) costs for the solar systems will be covered. Assuming that O&M costs are $0.02/kWh, O&M costs for a 150 kW PV system could average over $5,000 per year. Without a source to cover this cost, added O&M costs put a financial burden on the property; thereby discouraging

[54] Questions 11,15, and 16 of the ALJ's July 8, 2016 Ruling are covered in this section.

installation or, if not anticipated in the financial analysis, places the property at risk. Funding for O&M costs must be addressed in order for AB 693 implementation to be successful.

Ownership Pathways

The most direct way for property owners to own solar energy systems is where the property owner is leveraging Low Income Housing Tax Credits and federal investment tax credits as part of new construction or project refinancing and recapitalization. LIHTC-financed new construction and rehabilitation projects in particular provide opportunities to leverage resources in conjunction with the Multifamily Solar Roofs Program to install of solar energy systems. In 2015 alone, the TCAC awarded LIHTCs worth well over $2.5 billion to 221 new affordable housing properties and over 18,000 low-income residential units. By targeting projects receiving LIHTC funding, the Multifamily Solar Roofs program could lower average incentive payments and optimize the reach of the program. In order to target LIHTC properties and leverage this financing effectively, however, incentive reservation periods for the Multifamily Solar Roofs Program will need to 18 to 36 months to match the longer development periods associated with these larger construction projects.

Additionally, the LIHTC program encourages the adoption of above-code energy building standards for new construction,[55] and rehabilitation projects include energy efficiency investments to improve energy efficiency by at least 15%.[56] Hence, properties with LIHTC funding will automatically automatically meet the energy efficiency requirements adopted in AB 693.

Third Party Ownership Issues and Restrictions

There are a number of issues unique to TPO structures that should be addresses in the AB 693 program design should address including:

- *TPO MW and Funding Limitation Under the Multifamily Solar Roofs Program* – The ALJ asked specific question on whether program should place limits on the amount of

[55] In 2015, 58 of the 63 LIHTC funded new construction projects awarded 9% Tax Credits achieved LEED Gold or Silver standards,

[56] In 2015, all 27 LIHTC finding rehabilitation projects receiving 9% Tax Credit increases energy efficiency by 20% ir more and 30% of the projects included added sustainability measures such as solar PV.

incentive payments that can be paid to projects developed by any one third-party owner, or whether the program should include a limit on the number of MWs for projects developed by any one third-party owner, supplier, or installer.

Under the MASH 2.0 program, some solar providers have sought to monopolize the affordable housing market through MASH's reservation system. This has resulted in more limited contractor participation and has locked out some affordable housing properties wishing to participate in the program. Accordingly, we recommend that the Program Administrator phase the Solar Roofs application and reservation process during a year and limit the number of project reservations that a solar contractor or supplier or their affiliates can encumber during these periods, to build a more diverse and viable solar market for affordable housing.

To address this problem the following corrective actions are necessary:

i. Discontinue the practice of allowing solar companies to enroll multiple properties for a property owner at one time.
ii. Require that multifamily property owners make project applications.
iii. Establish process to phase application approvals on a quarterly basis
iv. Set a limit on project reservations that a housing applicant can receive during a quarter.
v. Provide property owners with conditional (60day) reservations to permit housing organizations to obtain competitive bids from multiple solar contractors before locking in reservations.

- *TPO Pricing* – Where a TPO agreement is proposed, and a significant portion of the project's cost are covered by incentives and other financial contributions from the property, the TPO agreement should be structured as pre-paid agreement to ensure that the property owner and the low-income tenants receive credit for these AB 693 investments. Additionally, we recommend that the Program Administrator monitor per kWh charges set by solar providers under TPO agreements to ensure that the per kWh changes are aligned with the amount of project costs financed and reasonable financing charges. Moreover, because escalators in TPO agreements can adversely affect out-year financial returns for the property owners, we recommend that cost escalators be prohibited under the program.

- *TPO Financial Projections* – The value of a TPO transaction is determined on the basis of the projected cash flow to the property owner. However, the reliance on cash flow projections can increase the risk to property owners, since the third party solar owners making the cash flow projection may be motivated to present more optimistic financial forecasts than actually supported to gain business by overstating savings estimates. This can occur in a number of ways:

    i. Not projecting all or the costs required by the agreement or including or disclosing the costs of rate escalators over the agreement period.

ii. Not properly correlating solar production with TOU rate structures.
iii. Not fully accounting for utility demand charges, utility fees or tariffs rate changes.
iv. Including savings from energy efficiency in financial forecasts.

Affordable housing owners serving low-income households under government imposed rent restrictions are both attracted by robust projections of future savings and ill equipped to cover gaps if financial projections are not achieved. For these reasons, we strongly recommend requiring robust information disclosures regarding projections about financial benefits and costs to protect this vulnerable market segment.

- *TPO Production Guarantees* – AB 693 requires that qualifying solar energy systems owned by third-party owners be subject to contractual restrictions to ensure that no additional costs for the system be passed on to low- income tenants and that third-party owners of solar energy systems provide ongoing operations and maintenance of the system, monitor energy production, and take appropriate action to ensure that the kWh production levels projected for the system are achieved throughout the period of the third-party agreement.[57]

  There are a number of practices that have been used by energy service contracting companies (ESCO) and solar PV companies to guarantee performance including providing specific annual guarantees of kWh production so that property owners are compensated for the amount of under production, or energy performance insurance, in which an insurance company guarantees performance levels. The Program Administrator should consult with the solar industry and other energy professions to determine the best options for ensuring that solar energy systems incentivized by payments from the Solar Roofs Program provide the production levels outcomes represented by the TPO.

[57] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(4).

VIII. Incentive Structure[58]

The incentive structure mandated by AB 693 is fundamentally different from the traditional approaches utilized for the MASH and SASH programs where program funding and capacity targets strongly influenced the underlying incentive structure.[59] Specifically, AB 693 states that in developing an incentive structure for Multifamily Solar Roofs program:

> "The commission shall ensure that incentive levels for photovoltaic installations receiving incentives through the program are aligned with the installation costs for solar energy systems in affordable housing markets and take account of federal investment tax credits and contributions from other sources to the extent feasible."[60]

This cost-based approach is necessary to ensure that the program has the capability to address financial barriers so that "solar energy systems [are] more accessible to low-income and disadvantaged communities,"[61] and that low-income renters are provided "a direct economic benefit from the qualifying solar energy system."[62]

MW Goal Should Not Affect Incentive Level

AB 693's goal to "install qualifying solar energy systems that have a generating capacity equivalent to at least 300 megawatts"[63] is reachable under the proposed program design but must be tempered by the practical considerations regarding how the goal was set and how the program is funded. The 300 MW goal set by AB 693 assumed full programmatic funding of $100 million annually for a period of 10 years. However, the level of funding for the Multifamily Solar Roofs program is contingent on the level of revenues received from the Cap and Trade auctions of GHG allowances allocated to electrical corporations pursuant to subdivision (b) of Section 95890 of Title 17 of the California Code of Regulations. Because of the general uncertainty about actual program funding over the period covered by the program, the Multifamily Solar Roofs Program should not adopt a MW capacity goal or an interim MW capacity goal that might

[58] Questions 7,15,16 and 23 of the ALJ's July 8, 2016 Ruling are covered in this section.
[59] D.15-01-027, January 9, 2015
[60] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(4).
[61] AB 693. Section 1(e).
[62] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(g)(2).
[63] AB 693. Section 1(f).

adversely affect incentive levels necessary to install solar energy systems to reach low-income renters at qualified multifamily properties.

Design of Incentive Structure to Meet AB 693 Objectives

To meet the objectives of AB 693 and address the financial barriers association with solar PV installations serving low-income rental units, we recommend that the incentive structure incorporate the following principles:

- *Solar Cost Indexing* – Index solar costs for multifamily solar energy systems and reduce system costs by the annual percent reduction in solar installation costs or 7% per year over the program period pursuant to SB1,[64] whichever is less.

- *Tiered Incentive Structure* – Provide different incentive levels for common areas and tenant units and adjust incentive levels to reflect economies of scale.[65]

- *System Ownership* – Promote incentive options that enable property ownership of the solar energy systems.

- *Tenant Systems:* Cover up to 100% of the costs for portions of the system providing generation and economic benefits to tenants adjusted for other sources funding the solar energy systems.

- *Common Area Systems:* Cover up to 70% of the costs of common area installations adjusted for other sources funding the solar energy systems.

- *Contributing Sources* – Provide different incentive levels that reflect contributions from the Federal ITC, LIHTC program, and other sources offsetting the costs of solar energy systems. To reflect transaction costs and uncertainty in tax credit calculation should be capped at $0.80/per credit.

- *Property Contributions* – Require a minimum property contribution that is limited to 80% of the estimated energy savings from common area installations. Contribution can be satisfied on the basis of payments made toward towards O&M costs and rent payments under TPO agreements.

- *Pre-Paid Agreements* – For solar energy projects financed by TPO structures, require pre-paid agreements if 90% or more the indexed solar costs of the solar energy system are covered from incentives, tax credits and other tax benefits.

[64] Public Utilities Code, SEC. 5. Section 387.5(b).

[65] The economies of scale cost adjustments shown in Table 8 be modified consistent with the general findings in the LBNL Tracking the Sun VIII report.

- *Storage Devices* – Incentive structure for energy solar systems should be consistent with incentive provided under the SGIP and capped based on 75% of the PV generations and other system design considerations discussed in Section XI.

Alignment of Incentives with Solar Costs

The requirements that the program's incentives be aligned with costs and take account of federal investment tax credits and contributions from other sources strongly suggest that the incentive structure be based on indexes of solar costs and funding sources available to support solar installations.[66]

This required alignment of incentives to solar costs and other funding sources is a significant change and enhancement to what occurred under the MASH program. The MASH program evaluation reported that:

> Despite declining installed system cost trends in the U.S. PV market, MASH system installation costs did not decrease over time. For comparison, SASH system installed costs decreased every year from 2011–2013.[67]

In this regard, the Lawrence Berkeley Laboratory's study, Tracking the Sun, provide some insights on why solar costs in certain residential markets have not declined at the same rate as other markets. The report found that "states with higher incentives and/or higher electricity rates may have higher installed prices as a result of value-based pricing."[68,69] This practice is very prevalent in solar transactions financed through Third Party Ownership (TPO) structures, such as Power Purchase Agreements (PPA), inclusive of the majority of solar installation under

[66] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(4).

[67] Navigant Consulting, California Solar Initiative—Biennial Evaluation Studies for the Single‐Family Affordable Solar Homes (SASH) and Multifamily Affordable Solar Housing (MASH) Low‐Income Programs Impact and Cost‐Benefit Analysis Program Years 2011–2013, December 1, 2015. California Public Utilities Commission.

[68] Galen Barbose, Samantha Weaver, Naïm Darghouth, Tracking the Sun VII: An Historical Summary of the Installed Price of Photovoltaics in the United States from 1998 to 2013, Lawrence Berkeley National Laboratory, September 2014. http://eetd.lbl.gov/sites/all/files/tracking_the_sun_vii_report.pdf

[69] Value-based pricing refers to a practice used by solar companies to provide PV service agreements based on the value of the solar to the customer, rather than based on the actual costs of the solar system (hard costs, installation costs, and development fees). The presumption by solar companies using this practice is that if the cash flow benefits are large enough, a property will look past the actual installations costs and added project costs paid over the period of the agreement.

the MASH program. The absence of cost reductions and cost controls for this program should raise concerns that the full benefits of the reductions in solar costs were not received by the tenants, property owners, or ratepayers and instead may have been directed elsewhere. Given the experience with the MASH program, safeguards are needed to ensure that the intended beneficiaries of the program and ratepayers receive the benefits that would result from cost reductions.

Develop and Use a Solar PV Cost Index

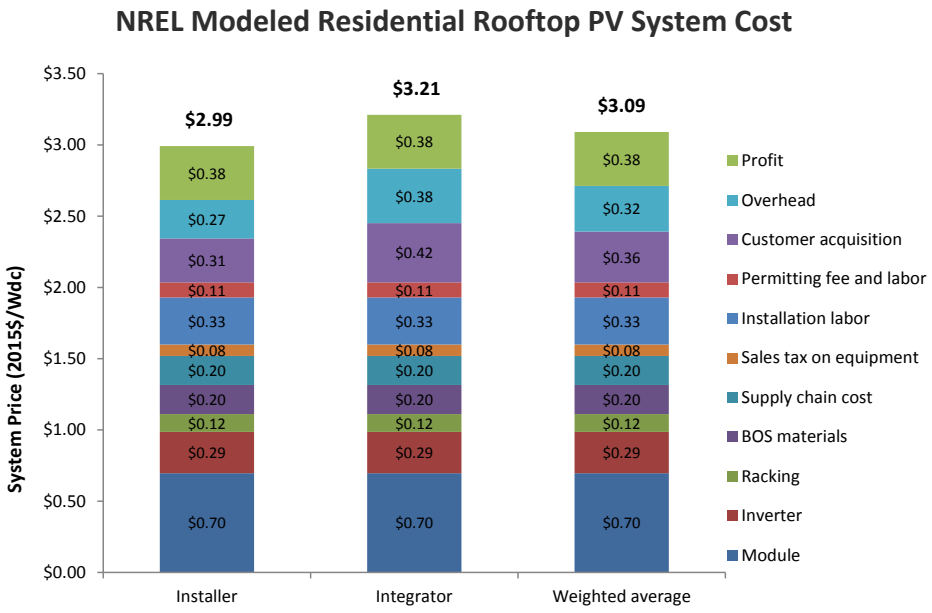
To meet the requirement in AB 693 that incentives be aligned with solar costs, we recommend that the Commission or Program Administrator for the Multifamily Solar Roofs Program develop a Solar Cost Index. The solar index should be developed in consultation with Lawrence Berkeley National Laboratory (LBNL) and the National Renewable Energy Laboratory (NREL) to ensure that an objective cost baseline is set for the program.[70]

As a starting point for estimating solar costs in California's residential markets, a recent report published by NREL[71] provides a useful benchmark of installed prices of U.S. solar photovoltaic (PV) systems built in the first quarter of 2015 (Q1 2015). This report is the first in an intended series of annual benchmarking reports covering residential and commercial solar PV installations. The analysis used a bottom-up methodology to capture variations in system cost and price driven by a number of factors. This approach enables benchmarking of system costs independent from price, which as NREL points out "is critical in understanding industry progress in reducing costs over time." The segment-specific models and inputs used by NREL to benchmark PV costs were reviewed and validated by industry and subject matter experts via

[70] LBNL has considerable expertise on performing solar costs analysis. The LBNL *Tracking the Sun* reports, developed with the Department of Energy, is a recognized reference of solar cost trends for grid-connected solar photovoltaic systems. The 2015 report includes data points from over 400,000 individual PV systems or 81% of all U.S. PV capacity installed through 2014.

[71] Donald Chung, Carolyn Davidson, Ran Fu, Kristen Ardani, and Robert Margolis, U.S. Photovoltaic Prices and Cost Breakdowns: Q1 2015 Benchmarks for Residential, Commercial, and Utility-Scale Systems, September 2015. National Renewable Energy Laboratory. Technical Report NRE/TP-6A20-64746. GTM Research, SEIA US Solar Market Insight Report. See: http://www.greentechmedia.com/research/subscription/u.s.-solar-market-insight

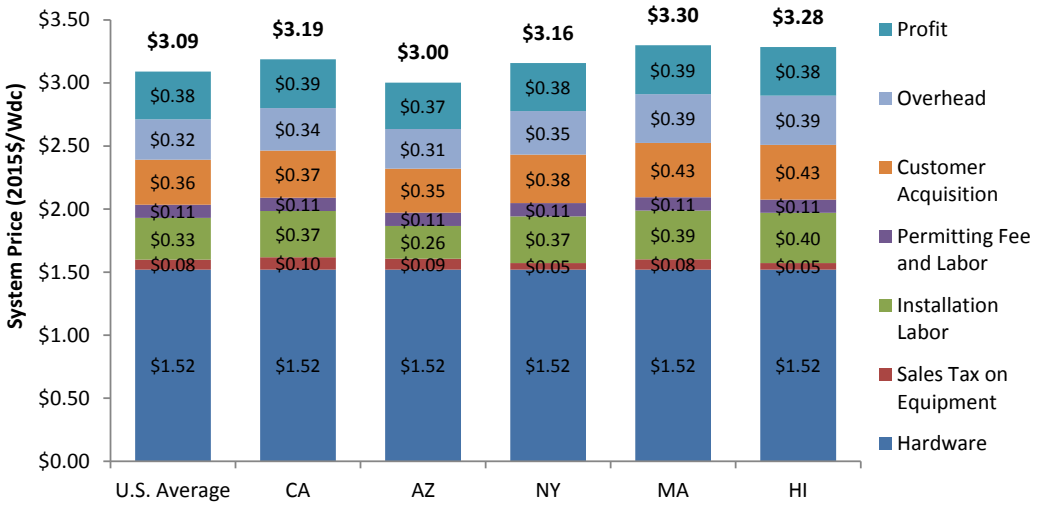
interviews as well as review of draft results. The findings of the analysis benchmarked residential solar PV costs at $3.09/watt. A breakdown of these costs in shown below.



Source: NREL September 2015

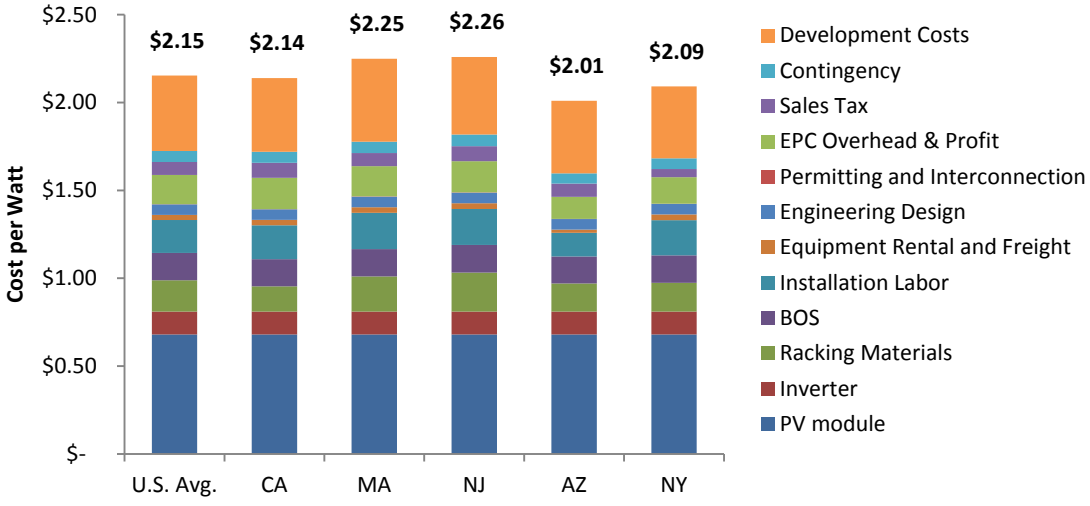
The NREL report also accounted for regional variations in solar costs for states including California and further analyzed the economies of scale gained as part of commercial installations for PV systems of 200 kW or more, which is a typical system size under the Multifamily Residential Roofs program. Aspects of this analysis are highlighted below.

Regional Variables in Residential PV System Cost



Source: NREL September 2015

Regional Variables in Commercial PV System Cost



Source: NREL September 2015

Recognizing that solar installations constitute a hybrid of the cost drivers for residential and commercial installation, we completed a review of NREL's report findings and LBNL's Tracking the Sun reports to develop an estimate of solar costs for multifamily rental properties. Based on this analysis we propose using a benchmarked PV systems costs of $3.20/watt for the purposes

of modeling incentive levels in this proposal. Findings from this analysis are summarized in the table at Appendix D.

Funding Source Index

In addition to aligning incentive levels with solar costs, AB 693 also requires that:

> The Commission shall ensure that incentive levels for photovoltaic installations receiving incentives through the program… account of federal investment tax credits and contributions from other sources to the extent feasible.[72]

In this regard, the Low Income Weatherization Program (LIWP) Large Multifamily program[73] has developed an incentive structure that attempts to account for contributions from federal ITCs and the LIHTC program. This solar incentive structure for this program is shown in the in Tables 7 and 8 may be a useful model to emulate in the Multifamily Solar Roof Program. The incentive structure shown below assumed a $3.50/watt cost for installed PV installations.

Table 7 – LIWP Large Multifamily
Affordable Multifamily Housing Solar Incentives *(Systems Less Than 100 kW)*

Funding Sources for PV			LIWP Incentives ($/watt)	
Federal ITC	LIHTC	MASH	Property Metered Systems	Tenant Metered Systems
Yes	Yes	No	$0.50	$1.50
Yes	No	No	$1.00	$2.40
Yes	No	Yes	0	$1.00
No	No	No	$1.50	$3.50
No	No	Yes	$0.80	$1.70

[72] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(4).
[73] Program Guidelines for the Large Multifamily LIWP program are available at: http://www.csd.ca.gov/Portals/0/Documents/LIWP/LIWP%20LMF%20Final%20Program%20Guidelines%20111015%20FINAL.pdf and at http://aea.us.org/efficiency-programs/low-income-weatherization-program-large-multi-family-ca.html.

Table 8 – LIWP Large Multifamily
Incentives Adjustments for PV Systems
(Systems Over 100kW)

kW--DC	Incentive Adjustment Factor
≤100	100%
101--300	80%
301--500	60%
≥501	40%

This structure addresses AB 693's requirement that the incentive structure be aligned with the costs of solar PV installations on multifamily properties and take account of other contributing resources, such as Federal Investment Tax Credits, that are available to reduce project costs. Accordingly, we recommend that a similar approach be used to create the incentive structure for the Multifamily Solar Roofs Program, inclusive of modifications to address AB 693's program objectives.

Proposed Incentive Structure for AB 693

The Non-Profit Solar Coalition recommends that the Commission adopt the incentive structure proposed in the tables below. The proposal accounts for assumptions about project cost and funding resources that may be available to reduce incentive requirements. Backup analysis for the proposed incentive levels is provided in Appendix E.

- Solar PV Incentives for Existing Multifamily Properties Without LIHTC Financing for Solar Installation

Table 9 – AB 693 PROPOSED INCENITVES
Existing Multifamily Properties Without LIHTC Financing

	Incentives for PV Installed for Tenant Units *($/DC Watt)*	**Incentives for PV Installed for Common Area** *($/DC Watt)*	**Notes**
Property Owned *(Purchased or Financed)* Systems	**$ 3.20**	**$ 2.20**	Property owned systems reflect property financial contribution for common area installations, financing costs, and system O&M costs, which is over 25% of overall costs.
Third Party Owned System	**$ 2.24**	**$ 1.60**	TPO system costs covered by property owner for either common area and tenant units. Property owner pay added costs under PPA commensurate with lower incentives.
Energy Storage	Devices > 10kW: $0.50/watt hour Devices < 10kW: $0.60/watt hour		Energy Storage capacity capped at 75% of PV generation.
Requirements	▪ PV system benefits tenants. ▪ PV system design includes energy efficiency reduction estimates. ▪ All systems installations include O&M service provided by the property owner or third-party owner of solar system. ▪ Solar contractors installing solar systems must include or other warrantee of system production for 10-years performance guarantee or other requirements. ▪ Per kWh charges under PPA agreement should not exceed the estimated energy cost savings from PV systems serving common areas. ▪ Contractor local hiring and property energy efficiency requirements address separately in proposal. ▪ Affidavit by property owner attesting that property will by subject to affordability for at least 10 years and that tenant benefits will not be recaptured by increases in rent payments.		

- Solar PV Incentives for Multifamily Properties With 4% LIHTC Funding for Solar Installations

Table 10 – AB 693 PROPOSED INCENITVES
Existing Multifamily Properties With 4% LIHTC Financing

	Incentives for PV Installed for Tenant Units *($/DC Watt)*	**Incentives for PV Installed for Common Area** *($/DC Watt)*	**Notes**
Property Owned *(Purchased or Financed)* Systems	**$ 1.92**	**$ 1.28**	Property owned systems reflect property financial contribution for common area installations, financing costs, and system O&M costs, which is approximately 30% of overall costs.
Third Party Owned Systems	**$ 0**	**$ 0**	Not cost effective.
Energy Storage	Devices > 10kW: $0.50/watt hour Devices < 10kW: $0.60/watt hour		Energy Storage capacity capped at 75% of PV generation.
Requirements	▪ PV system benefits tenants. ▪ PV system design includes energy efficiency reduction estimates. ▪ All systems installations include O&M service provided by the property owner or TPO of the PV system. ▪ Solar contractors installing solar systems must warranty or guarantee PV production for at least 10-years. ▪ Contractor local hiring and property energy efficiency requirements address separately in proposal. ▪ LIHTC Tax Credit contributions for solar project capped at $0.80/per tax credit to allow for transaction costs and fluctuations in pricing over time. ▪ Affidavit by property owner attesting that property will by subject to affordability for at least 10 years and that tenant benefits will not be recaptured by increases in rent payments.		

- Solar PV Incentives for Multifamily Properties With 9% LIHTC Funding for Solar Installations

Table 11 – AB 693 PROPOSED INCENITVES
Existing Multifamily Properties With 9% LIHTC Financing

	Incentives for PV Installed for Tenant Units *($/DC Watt)*	**Incentives for PV Installed for Common Area** *($/DC Watt)*	**Notes**
Property Owned *(Purchased or Financed)* Systems	**$ 0.25**	**$ 0.25**	Over 90% of systems costs paid for by the property.
Third Party Owned System Installations	**$ 0**	**$ 0**	Not cost effective
Energy Storage	Devices > 10kW: $0.50/watt hour Devices < 10kW: $0.60/watt hour		Energy Storage capacity capped at 75% of PV generation
Requirements	▪ PV system benefits tenants. ▪ PV system design includes energy efficiency reduction estimates. ▪ All systems installations include O&M service provided by the property owner or TPO of the PV system. ▪ Solar contractors installing solar systems must warranty or guarantee PV production for at least 10-years. ▪ Contractor local hiring and property energy efficiency requirements address separately in proposal. ▪ LIHTC Tax Credit contributions for solar project capped at $0.80/per tax credit to allow for transaction costs and fluctuations in pricing over time. ▪ Affidavit by property owner attesting that property will by subject to affordability for at least 10 years and that tenant benefits will not be recaptured by increases in rent payments.		

- Solar Adjustment Factors

We further propose that the incentive levels proposed in the tables above be adjusted based the following factors listed below.

Table 11 – AB 693 PROPOSED INCENITVES
Solar Incentive Level Adjustment Factors

Annual Solar Cost Adjustment	
Recommendation	**Adjustment Incentive Amount**
▪ **Make incremental adjustment to incentive levels to reflect project economies of scale**	Incremental reductions to proposed solar PV incentive levels reflect labor and other cost reductions due to economies of scale savings documented in NREL report.
- Systems les than 200 kW	No changes in incentive level.
- *Systems Over 200 kW but less than 300 kW*	85% of recommended incentive
- *Systems over 300 kW but less than 400 kW*	75% of recommended incentive level.
- *Systems over 400 kW*	70% of recommended incentive level.
Recommendation	**Adjustment Incentive Amount**
▪ **Make annual adjustment to incentive levels to reflect solar cost reductions**	Pursuant to Section 387.5 of the Public Utilities Code, solar incentive amount should decrease by the percent decline in residential solar costs as reported by LBNL, or by 7% as required in SB 1.[74]

[74] Public Utilities Code, SEC. 5. Section 387.5(b).

Including Energy Efficiency and Storage Devices Under AB 693 Will Help Meet or Exceed the 300 Megawatt Solar Goal

To determine whether the proposed incentive levels for solar energy systems is aligned with the goal of installing "solar energy systems that have a generating capacity equivalent to at least 300 megawatts,"[75] we undertook an analysis of the proposed incentive structure. In this analysis we considered whether potential investments in energy storage and energy efficiency could also be made along with the investments in solar PV and still meet the 300 MW target for the program.[76]

The analysis shows that the 300 MW goal can be reached, or be surpassed, under the proposed incentive structure and that investments in both energy efficiency and storage to solar PV could be included with the installation of solar PV as part of the integrated energy strategy described in this proposal, and reach the 300 megawatt target.

- *Assumptions*: In the analysis we assumed that 10% of funding allocated for the Multifamily Solar Roofs Program is provided for program administration costs. We also made the assumption that an additional 10% of the funding allocation could be used to support energy efficiency measures as a result of funding shortfalls in other energy efficiency programs.[77] From this baseline, $80 million annually would be available for investments in solar energy systems (Solar PV+Energy Storage).

  Under the investment structure, the highest level of solar PV incentives proposed is for property owned solar energy systems at existing multifamily properties. This incentive tier proposes $3.20/watt for PV serving residential units and $2.20/watt for PV serving common areas. For this category of installations there are no other leveraged funding sources to offset costs, and no use of TPO financing structures. To assess sensitivities regarding program financing we assumed that 100% of the solar PV installations are at this level since this category of funding would place the highest demand on incentives. For energy storage, we assumed an incentive level of $0.50/Watt Hour, which is consistent with levels in the SGIP program.

[75] AB 693. Section 1(f).
[76] The target of installing at least 300 MW of new solar capacity is based on a funding scenario in which the program is allocated the full level of funding authorized under Section 2870(c) over the 10-year period.
[77] As noted in Section X, the use of AB 693 funding allocations for energy efficiency would only be considered as a last resort if funding from other energy efficiency programs or accounts is not available.

For PV installation costs, we assumed an average cost of $3.20/watt, which is described in the proposal. For a 270kW system designed to offset 70% of residential electricity use and 100% of common area use in a multifamily property, the estimated cost would be $764,000.

The energy storage system's capacity and costs is based on an analysis performed by Geli,[78,79] which is described in detail in Section XI. The design of this system is integrated with the solar PV installation to optimize peak reductions for both residents and common areas. For a storage system designed to optimize electric bill reduction for both residents and common areas, this would add an additional $180,000 in cost for a 360 kilowatt-hour storage device at an incentive of $0.50/watt-hour. The analysis done assumes that 100% of the properties installing PV would also incorporate storage devices. Energy storage would be options under the program and this assumption is far in excess of what is expected under the program. It is used here to model a worst case scenario.

The capacity and costs for the solar energy system (Solar PV+Energy Storage) is shown in Table 12. To model out-year costs, we assumed a 7% reduction in solar PV costs and a 5% reduction in storage costs each year.

Table 12 – AB 693 Budget Analysis
PV Capacity and Cost Estimates

	Residential units	Common area	Entire Property
PV capacity (kW)	170[80]	100	270
PV incentive ($/W)	$3.20	$2.20	$2.83
Total PV incentive	$544,000	$220,000	$764,000
Storage size (kWh)	270	90	360
Storage incentive ($/Wh)	$0.50	$0.50	$0.50
Total Storage incentive	$135,000	$45,000	$180,000
Total incentive	**$679,000**	**$265,000**	**$944,000**

[78] Based on Geli analysis of tenant bill savings under time-of-use rates for 75 unit affordable housing property.
[79] Based on largest system size found to be economic for affordable housing properties analyzed in Closing the California Clean Energy Divide, available at http://www.cleanegroup.org/ceg-resources/resource/closing-the-california-clean-energy-divide/
[80] Solar PV assumptions based on analysis presented in Appendix E: Incentive Structure for PV Installation.

Findings: The results of the analysis are shown in Table 13 over the ten-year life of the program. Key findings include:

i. First year generating capacity is estimated of 22.9 MW. This estimate is a worst-case scenario since it assumes that 100% of the installations are funded at the highest incentive level proposed for the program and that 100% of the installations include energy storage systems.
ii. Cumulative deployment of solar PV –including efficiency and storage– over an anticipated ten-year lifetime of the incentive program would be **317 MW**. If the inclusion of energy storage devices is adjusted to 50% of the properties, which is a more realistic expectation, the estimated added generated capacity would be **354 MW**. If more blended funding scenarios are used to reflect the different incentive structures proposed, the case, the estimate could exceed 400MW.
iii. Inclusion of storage devices could increase annual affordable housing electric bill savings by an ***additional $21 million per year*** over the lifetime of the program, amounting to $317 million in storage-enabled saving over the anticipated life of the systems.

Table 13 – AB 693 Capacity Generation Analysis
Estimated Outcomes of Integrated Solar Energy Systems

Year	PV incentive ($)	Storage incentive ($)	PV capacity (MW)	Cumulative PV capacity (MW)	Annual storage savings (million$)	Cumulative storage savings (million$)
1	764,000	180,000	22.9	22.9	1.5	1.5
2	710,520	171,000	24.5	47.4	1.6	3.1
3	660,784	162,450	26.2	73.6	1.7	4.8
4	614,529	154,328	28.1	101.7	1.9	6.7
5	571,512	146,611	30.1	131.8	2.0	8.7
6	531,506	139,281	32.2	164.0	2.1	10.8
7	494,301	132,317	34.5	198.5	2.3	13.1
8	459,699	125,701	36.9	235.4	2.5	15.6
9	427,521	119,416	39.5	274.9	2.6	18.2
10	397,594	113,445	42.3	317.1	2.8	21.0

Of course, if funding levels are less than anticipated, these numbers would change, but then so presumably would the target. The analysis establishes that there is no factual basis for arguing against the inclusion of energy efficiency and energy storage based on program's ability to reach AB 693's MW goal at full funding levels.

IX. Local Hiring Requirements[81]

AB 693 requires that the Commission "establish local hiring requirements for the program to provide economic development benefits to disadvantaged communities."[82] Particularly over the last five years, local hiring has been accepted as a key anti-poverty tool across the state. Consequently, there are now a wide range of local hiring policies: "good faith" First Source local hiring policies, San Francisco's mandatory Local Hiring Policy for Construction, U.S. Department of Transportation's local hiring pilots, among many others. AB 693 has also sought to similarly guarantee good-paying jobs for residents of disadvantaged communities within the solar industry. The Joint Parties feel strongly that the most effective way to ensure that rooftop solar installations provide economic development benefits to disadvantaged communities is to ensure that those installations translate into good paying, long-lasting jobs for local disadvantaged residents.

The Program's local hiring policy should include a robust data collection requirement.

The local hiring policy design should include reliable and granular workforce data collection. The collected data will be critical to not only determining the success of AB 693's local hiring requirements, but also providing insights as to how to improve local hiring policies in future iterations of the program. The Commission should require contractors to provide data to the Program Administrator on:

- The number of work-hours performed by local residents, disadvantaged residents, minority workers, and women workers as well as the total number of worker-hours performed for each project
- Job retention, namely the length of time the contractor keeps local residents employed
- Employee access industry-recognized certifications
- Wages and benefits of all temporary, part-time and full-time employees
- Employee travel distance and/or travel time to the worksite

Collecting this data will require a unified workforce reporting system that collects certified payroll reporting. Reflecting the diversity of the state, this reporting system should have modules capable of tracking different local hiring policies, ranging from "good faith" to

[81] Question 12 ,of the ALJ's July 8, 2016 Ruling are covered in this section.
[82] § 2870(f)(6).

mandatory local hiring policies. The system should also be dynamic as well by tracking data in real time and allowing the awarding body to forecast how much workforce is needed. The system's granular measurement of project work-hours will measure the success of job training service providers, help to focus training dollars, and adjust local hiring policies for underutilized and overutilized trades.

The Commission should also require compatibility with other major workforce data collection systems, particularly in housing and energy efficiency. For instance, Section 3 of the HUD Act of 1968 is the legal basis for providing jobs for residents and awarding contracts to businesses in areas receiving certain types of HUD financial assistance. Given the sheer volume of HUD work,[83] Section 3 data collection and reporting has become standardized among the many developers, contractors, and subcontractors on HUD-financed projects. The workforce data collection system also provides key policy guidance for housing authorities, redevelopment agencies, and federal Department of Housing and Urban Development (HUD). Similarly, the Commission should seek to compatibility with this pre-existing system.

For this Program, workforce data collection should be implemented with little to no additional administrative burden on contractors. The process and reporting mechanism should leverage existing contractors' internal reporting capabilities and accommodate any template for certified payroll reporting system used in the state. Utilizing a workforce reporting system that has been adopted most major counties in California would also avoid additional burdens or costs to contractors already familiar with the basics of certified payroll reporting. By taking advantage of existing workforce development frameworks and practices, the Commission can thus be sensitive to the needs of contractors by adopting one unified, structurally manageable and scalable workforce reporting system.

[83]From 2012 to 2015, HUD funding generated 110,500 jobs for new Section 3 employees and trainees as well as $4.8 billion awarded to Section 3 businesses. U.S. Department of Housing and Urban Development, "Section 3: Connecting Low-Income Residents with Opportunity", June 23, 2016, available at: http://portal.hud.gov/hudportal/documents/huddoc?id=section3_brochure_final.pdf

The Commission should initially establish base floor requirements for local hiring that will evolve into stronger policies.

Reflecting the diversity of the state, local hiring requirements for AB 693 should be both flexible and strong enough to shift the market focus to prioritizing job opportunities for local, low-income and disadvantaged communities. Solar installers receiving Program incentives should proactively work with local Workforce Investment Boards (WIBs) and local job training organizations to recruit new hires from local disadvantaged communities. To ensure the quality of jobs that go to local disadvantaged residents, solar installers should adhere to prevailing wage requirements when such requirements are triggered by leveraged financing sources on Program projects, as San Francisco's successful mandatory local hiring law does. Finally, solar installers receiving Program incentives should collect and make publicly available sufficiently detailed data to inform future local hire policies.

The Program's local hiring policy should primarily focus on job placement rather than job training.

While Joint Parties recognize that job training is an important element of a providing economic development benefits to disadvantaged communities, we believe that the Program should focus primarily on job placement. First, the text of AB 693 explicitly calls for the Commission to establish "local hiring requirements." It does not ask the Commission to establish a job training requirement. Second, Joint Parties believe that the state's solar workforce development goals would be best served by having the Program translate the success of previous job training requirements into actual job placement.

Job training requirements in previous state-wide solar incentive programs, such as the Single Family Affordable Solar Homes (SASH) and the Multifamily Affordable Solar Housing (MASH) programs, have been successful in increasing the pool of disadvantaged residents who are qualified to perform residential solar installations. But job training is not sufficient to fully realize the potential community economic development benefits of affordable housing solar

incentives and is meaningless if it is not followed by job placement. Thus, while AB 693 should include a job training component, efforts related to job training should be a much smaller part of the program compared to job placement. Requiring actual job placement for disadvantaged residents is essential to creating long-lasting economic benefits for disadvantaged residents and their communities.

A number of job training service providers and community-based organizations have demonstrated strong commitment to both job training and placement in the solar industry, including organizations such as Grid Alternatives, Rising Sun Energy Center, San Francisco Conservation Corps, Asian Neighborhood Design, among many others. To take advantage of these existing job training programs, the Commission should establish an electronic data source to list all available workforce from local, low-income and disadvantaged communities, thus enabling collaboration between local job training organizations and contractors and ensuring an effective balance between workforce demand and supply.

It is also important to emphasize that low-income and disadvantaged workers may have barriers to accessing training programs due to lack of compensation during training programs. In addition, these workers face other barriers such as adequate transportation, childcare obligations, and other barriers. We therefore recommend that the Commission target training programs that have been able to address one or more of these barriers to training.

<u>For the first three years of solar projects funded by AB 693, the Commission should adopt a broad local hire base requirement coupled with a requirement to comply with prevailing wage requirements on Program projects when such requirements are triggered by leveraged financing sources</u>

For the first three years of implementation, the Commission should require contractors receiving Program incentives to make a good faith effort to hire local residents for its installations. The Commission should also require contractors to comply with state prevailing wage requirements on solar energy systems installed through the Multifamily Solar Roofs Program when such requirements are triggered by leveraged financing sources. A "good faith

effort" to hire local residents means that contractors should proactively reach out to local WIBs and job-training organizations to find qualified local residents to fill open positions.

AB 693 does not explicitly define "local hire." However, this term "primarily refers to programs that require direct hiring of residents of specific local areas.[84] Considering the significant demographic variation throughout the state, "local resident" should be broadly defined as an individual residing in the same county as the project or an individual hired from a job-training organization located in the same county as the project. To ensure that AB 693 local hiring requirements "provide economic development benefits to *disadvantaged communities*,"[85] the Commission should prioritize hiring from CalEnviroScreen-designated disadvantaged communities and low-income communities as well as the hiring of disadvantaged workers.

The plain language of AB 693 supports prioritizing workers from these communities. Section 2870(f)(6), the local hire provision, clearly requires that "local hiring" requirements "provide economic development benefits *to* disadvantaged communities."[86] In other words, disadvantaged communities are the primary intended beneficiaries of the local hiring requirements. This provision is supported by one of the bill's legislative declarations, which proclaims: "[i]nstalling qualified solar energy systems *in* disadvantaged communities can provide *local* economic development benefits."[87] This paragraph demonstrates that the Legislature views solar installations in disadvantaged communities as providing "local" (i.e., in a disadvantaged community) economic benefits, such as job opportunities.

[84] UCLA Labor Center, Exploring Local Hire: An Assessment of Best Practices in the Construction Industry, p. 13 (March 2014), *available at* http://www.labor.ucla.edu/publication/exploring-targeted-hire/.
[85] Cal. Pub. Util. Code § 2870(f)(6) (emphasis added).
[86] Cal. Pub. Util. Code § 2870(f)(6).
[87] AB 693 Section 1(c) (emphasis added).

For projects located in CES DACs, contractors should prioritize hiring residents located in communities designated as disadvantaged by CalEnviroScreen[88] in the county where the project is sited. If there are not enough qualified workers from CES DACs, workers should then be pulled from low-income communities outside of CES DACs but still within the county where the project is sited. For projects located outside of CES DACs, contractors should prioritize hiring residents of low-income communities within the county where the project is located. If, after first seeking workers from CES DACs and low-income communities there remains an insufficient number of qualified workers, other workers may be selected from across the county. If the contractor cannot fill an open position with a qualified local resident, it should submit to the Program Administrator a written description of the steps it took to find a qualified local resident, reasons that it did not hire a local resident referred to them by a local job-training organization if there was such a referral, and the city and county of residence of the worker it did hire. These recommendations not only align with the language and intent of AB 693, they also target communities that may be the most in need of economic opportunities and ensure that contractors have a broad pool of workers to choose from to avoid project delays.

Additionally, contractors should make a particular effort to hire disadvantaged workers. A disadvantaged worker is someone who faces or has overcome at least one of the following barriers to employment: being homeless; being a custodial single parent; receiving public assistance; lacking a GED or high school diploma; participating in a vocational English as a second language program; or having a criminal record or other involvement with the criminal justice system.[89] As with the prioritization recommendation above, the program administrator would retain the flexibility to seek other qualified workers when disadvantaged workers are unavailable.

[88] The cut-off point for CalEnviroScreen-designated disadvantaged communities for the purposes of the local hiring policy should coincide with the adopted cut-off point for the Program as a whole. That is, if the Commission adopts Joint Parties' proposal to define "disadvantaged communities" for the Program as the top 25% of CES-designated disadvantaged communities *either* across the state *or* by IOU territory (whichever captures a greater number of census tracts), the same measure should be used for the local hiring policy.

[89] This definition borrows from San Francisco's definition of "disadvantaged worker." See San Francisco Administrative Code § 6.22(G)(2)(g).

Finally, to ensure that the Program provides meaningful and substantial economic benefits to disadvantaged communities, the Commission should require contractors to comply with prevailing wage standards for all of their work on AB 693 projects when such requirements are triggered by leveraged financing sources. Prevailing wage standards are intended to ensure that public monies create good paying jobs. Similarly, the Commission should ensure that individuals working for contractors receiving incentives under AB 693 make a sustainable living wage.

At the end of three years, the Commission should also require each of the Program Administrator to issue a summary report detailing their local hiring results. As described above, these results would report out the granular data collected within each IOU territory. These reports should also include breakouts of local hiring by county as well as a survey of the contractors and other workforce development system stakeholders. Assessing three years of this data as a foundation, workforce stakeholders and the Commission will then be able to further evolve local hiring policies and targeting of disadvantaged communities across the state of California.

X. Energy Efficiency Requirements[90]

To meet the legislative requirements of AB 693, and to ensure solar systems are cost-effectively sized for efficient building loads, we recommend the CPUC adopt a 15% energy efficiency requirement for participating buildings, with associated support in services and funding.

The 15% energy efficiency requirement would include:

- A comprehensive audit and implementation plan
- A 3 year flexibility provision to complete identified improvements
- Alternative compliance mechanisms, e.g. proof of recent retrofit or meeting a set Energy Usage Intensity benchmark
- Full technical and programmatic support for owners
- Funding support via existing programs and an additional fund that leverages one or more of the following funding sources:
    - Unspent AB 693 funding
    - New funding under PUC Code section 748.5
    - Energy Savings Assistance Program general or unspent funds
    - Energy Efficiency portfolio program general or unspent funds

The efficiency component would also contribute towards meeting the state's efficiency doubling requirement under SB 350.

Legislative Requirements

AB 693 requires that:

> The commission shall establish energy efficiency requirements that are equal to the energy efficiency requirements established for the program described in Section 2852, including participation in a federal, state, or utility-funded energy efficiency program or documentation of a recent energy efficiency retrofit.[91]

The applicable language under PUC Code section 2852 states:

> (c)(3) All moneys set aside for the purpose of funding the installation of solar energy systems on low-income residential housing that are unexpended and unencumbered on January 1, 2022, and all moneys thereafter repaid pursuant to paragraph (2), except to the extent those moneys are encumbered pursuant to this section, *shall be utilized to augment existing cost-effective energy efficiency measures in low-income residential housing that benefit ratepayers*.[92]

[90] Questions 22 and 10 of the ALJ's July 8, 2016 Ruling are covered in this section.
[91] AB 693 amendments to Public Utilities Code, Section 2870(f)(7).
[92] PUC, Section 2852(d)(2), emphasis added.

> (d) In supervising a program implementing the California Solar Initiative pursuant to this section, the commission shall ensure that the program does all of the following:
> (d)(2) Requires participants who receive monetary incentives to enroll in the Energy Savings Assistance Program established pursuant to Section 382, if eligible.[93]

AB 693 thus requires qualified multifamily properties receiving assistance under the Multifamily Solar Roofs program to undertake energy efficiency improvements as a condition of receiving incentives for the solar energy system. Furthermore, PUC Code section 2852(c)(3) establishes that unencumbered funds can be used to augment cost-effective energy efficiency measures.

Additionally, SB 350, enacted during the same legislative session as AB 693, establishes a requirement "to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation,"[94] and requires the CPUC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings by January 1, 2030.[95] Under SB 350, the requirements established to double energy efficiency may be achieved through energy efficiency savings and demand reduction resulting from a variety of programs, including "a comprehensive program to achieve greater energy efficiency savings in California's existing residential and nonresidential building stock pursuant to Section 25943."[96] Under Section 25943 of the Public Resource Code, a comprehensive program may include "a broad range of energy assessments, building benchmarking, energy rating, cost-effective energy efficiency improvements, public and private sector energy efficiency financing options, public outreach and education efforts, and green workforce training."[97]

Thus, the scope and the requirements prescribed for on AB 693 pertaining to energy efficiency, local hiring, outreach and education, as well as the solar investments and financing options, provide a comprehensive platform to advance the achievement of SB 350 mandates in the affordable multifamily housing market.

[93] PUC, Section 2852(d)(3)
[94] SB 350. Section 2(a)(2).
[95] SB 350. Section 6(c)(1).
[96] SB 350. Section 6(d)(2).
[97] Public Resource Code. Section 25943(a)(2).

Energy Efficiency Program Design

We recommend the Commission consider the following factors in designing an effective energy efficiency component for the Multifamily Solar Roofs Program:

- *Energy Efficiency Goals*: The energy efficiency element of the Multifamily Solar Roofs program should require a minimum energy improvement goal. We recommend that the goal be designed to achieve a minimum reduction in net energy use (before solar) of at least 15% per property, as leading whole-building programs currently require.[98] The design of the energy efficiency portion of this program should be based on this requirement.

- *Incorporation of Efficiency in Solar System Design*: Linking energy efficiency with the installation of solar energy systems can help reduce the cost of the installed system by reducing the associated load. Starting with energy efficiency also ensures compliance with the state's loading order.[99] Before investing in more expensive solar options, more cost effective improvements that reduce – not offset –energy use should be incorporated into the investment strategy. If it is not possible to make the investment in energy efficiency before the solar installation, then the solar system size should be capped to accommodate a future investment based on the energy efficiency reductions identified by an energy efficiency audit.

- *Affordable Housing Market Specific Solutions*: The Bay Area Regional Energy Network (BayREN) and the Large Multifamily LIWP program have designed and implemented successful energy efficiency programs that are models for the Multifamily Solar Roofs Program. These programs have been able to enroll and scale energy efficiency improvements in multifamily markets described by IOU energy efficiency administrators as "underserved" and "hard to reach." Core elements of these programs that contribute to their success and acceptance by multifamily property owners include: providing no cost front-end technical support, "One-Stop" program offerings from design to full implementation of energy improvement plans, and property owner selection of installation contractors.

[98] The 15% energy performance requirement recommended for AB 693 is consistent with the minimum energy reduction requirements set for the multifamily Energy Upgrade California program administered by IOUS and Regional Energy Networks, and the statewide Large Multifamily Low Income Weatherization administered by the California Department of Community Services Development (CSD) and funded from Cap and Trade allocations. Specifically, both BAYREN's whole-building multifamily program and CSD's large multifamily program now require a 15% threshold.

[99] "As stated in Energy Action Plan I and reiterated here, cost effective energy efficiency is the resource of first choice for meeting California's energy needs. Energy efficiency is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change." CPUC/CEC, Energy Action Plan II, Implementation Roadmap for Energy Policies (October 2005). Available at: http://docs.cpuc.ca.gov/published/REPORT/51604.htm; "The electrical corporation shall first meet its unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." Cal. Public Util. Code § 454.5(b)(9)(C).

- *Funding Resources*: Within affordable housing markets, energy efficiency improvements for both residential units and common areas requires significant upfront funding support. Affordable multifamily housing is defined by rent affordability and other regulatory restrictions that limit property cash flow and owners' abilities to undertake whole building energy efficiency retrofits outside of project refinancing cycles (which often extend beyond twenty years). Additionally, equipment replacement reserves are limited and generally insufficient to cover the costs of major energy improvements or whole building energy efficiency retrofits. To address property resource constraints in implementing energy efficiency improvements, we recommend that utility customer and Greenhouse Gas Reduction Fund energy efficiency programs, such as the Energy Upgrade California and CSD's LIWP Large Multifamily program, be leveraged to enable whole building energy investments for this sector. As described below, we also strongly urge the Commission to make additional funds available to supplement likely remaining shortfalls. Such an approach is necessary to mitigate funding barriers and to address low-income energy cost burdens.

- *Phased Implementation*: Energy improvements in multifamily properties are often planned around scheduled equipment replacements, vacancies, and recapitalization events. Flexibility should be provided with regards to the scheduling and phasing of energy improvements to mitigate scheduling conflicts or negative impacts on solar energy system installations.

- *One Stop Implementation:* To successfully implement the program, comprehensive technical support must be provided to the property owner to assess energy efficiency opportunities and to develop a corresponding energy efficiency strategy and plan that meets the needs of the property owner and tenants. This support must include (1) an energy audit that provides a detailed analysis of energy usage, costs, and the building systems and conditions affecting energy consumption, and (2) support services to coordinate integrated funding of resident units and common area energy efficiency improvements. The BayREN Multifamily Energy Upgrade program and the Large Multifamily LIWP program have adopted *service delivery plans* to integrate these support services into their program designs. We recommend these service delivery plans be replicated by the Multifamily Solar Roofs Program.[100]

- *Presumption of Compliance*: Qualified properties participating in the Multifamily Solar Roofs Program should be presumed to have satisfied the program's energy efficiency requirements if the property has undergone a whole-buildingenergy retrofit within the last three years that was supported through a recognized energy efficiency program.[101] We recommend defining a whole-building retrofit as one that can reasonably be expected to have achieved

[100] Information in the service delivery and plans adopted by the multifamily BayREN and Large Multifamily LIWP programs is available at: www.camultifamilyenergyefficiency.org and www.bayareamultifamily.org.

[101] These programs include the Multifamily Energy Upgrade California that are administered by IOUs, Regional Energy Networks, or CCA, (IOU, REN, or CCA administered), the large and small multifamily Low Income Weatherization administered by the California Department of Community Resources Development (CSD) LIWP, and energy efficiency improvements funded by the California Tax Credit Allocation Committee (TCAC).

10-15 percent savings, or a building that was newly constructed or substantially rehabilitated within the last three years and met or exceeded Title 24 energy building performance standards. Additionally, for affordable housing organizations with established energy benchmarking programs, the Program Administrator could establish a presumption of compliance through demonstration that the affordable housing property meets prescriptive Energy Use Intensity (EUI) thresholds or Portfolio Manager benchmark scores set by the Program Administrator.

Proposed Energy Efficiency Program Structure, Requirements, and Process

We recommend that the energy efficiency requirements for the Multifamily Solar Roofs

Program be implemented through the following steps.

- *Energy Efficiency Program Technical Support Administrator*: The Program Administrator contracts with an Energy Efficiency Program Administrator to facilitate the implementation of resident and common area energy efficiency improvements at the multifamily site. The Energy Efficiency Program Administrator provides technical assistance in evaluating site conditions and opportunities for energy efficiency improvements and facilitates property owner and tenant access to available energy efficiency resources; similar to what occurs under the BayREN and LIWP programs.

- *Energy Audit and Work Scope Development* – After initial project intake, the Energy Efficiency Program Administrator provides or approves an ASHRAE Level 2 or higher energy audit, which includes a billing analysis and comprehensive assessment of site energy savings opportunities. The energy audits are shared with the property owner and provide a baseline for preparing an Energy Improvement Plan. The energy efficiency reductions identified by the audit must also be considered and factored into the design of the solar energy system.

- *Approval of Scope of Work* – The property owner reviews the energy audit and proposed scope of work with the Energy Efficiency Program Administrator and together they approve an Energy Improvement Plan (EIP) that includes some or all of the recommended energy efficiency measures. The approved Energy Improvement Plan must reduce energy use by at least 15%. Approval of the Energy Improvement Plan is a condition of program participation.

- *Energy Benchmarking* – The property owner is required to benchmark their property to assess current energy use and monitor the energy performance of the property to the extent that whole-building energy usage data is made available by utilities pursuant to requirements et by AB 802. AB 802, which requires the benchmarking of energy usage data for multifamily buildings with 5 or more units with greater than 17 accounts and 50,000 square feet.[102] The Energy Efficiency Program Administrator will provide support to assist property owners in implementing energy benchmarking requirements.

[102] AB 802 revises PRC Section 25402.10 to require utilities to provide energy consumption data for covered buildings to the building owners upon request, and requires the Energy Commission to establish a building energy use benchmarking and public disclosure program for certain buildings including multifamily housing.

- *Energy Efficiency Phasing and Scheduling* – The property would have up to 36 months to fully implement the Energy Improvement Plan. During this period, energy improvements will be phased in at the property in conjunction with scheduled equipment replacements, vacancies, and as energy efficiency program rfunds become available to the property owner.

- *Energy Efficiency Program Access and Integration* – The Energy Efficiency Program Administrator assists the multifamily property owners and tenants in developing a funding plan for planned energy efficiency improvements and accessing energy efficiency resources available under utility customer and Greenhouse Gas Reduction Fund programs.

- *Project Completion and Documentation* – Once the approved measures in the Energy Improvement Plan are installed, the property submits a certification that the energy efficiency plan has been implemented. The energy efficiency technical administrator should undertake random site inspections or other reviews to verify installation.

Funding for Energy Efficiency Requirements

We recommend the Commission ensure that comprehensive funding for energy efficiency improvements is made available under the Multifamily Solar Roofs program via the following funding sources, in order of priority:

- *Existing Energy Efficiency Programs*: We recommend funding for comprehensive energy efficiency improvements primarily be made available from utility customer, Greenhouse Gas Reduction Funded programs, and housing finance programs. These programs include the Energy Upgrade California Multifamily programs that are administered by IOUs, Regional Energy Networks, or CCA, (IOU, REN, or CCA administered), the large and small multifamily Low Income Weatherization Program (LIWP) administered by the California Department of Community Services and Development (CSD), and energy efficiency improvements funded by Low Income Tax Credits awarded by the California Tax Credit Allocation Committee (TCAC). The Commission can greatly enhance access to ratepayer energy efficiency programs by adopting rules requiring greater integration across the ratepayer energy efficiency programs, and by allowing utilities to pool funds from their respective programs for purposes of the AB 693 efficiency requirement. Currently, these resources are siloed and extremely difficult to leverage or combine for eligible energy efficiency projects. Pooling funds would enable owners to do comprehensive retrofits by minimizing numerous and often conflicting participation requirements. Appropriate energy savings credit could be apportioned to the respective program administrators.

- *Unspent AB 693 funding*: Unspent funding from prior year AB 693 allocations should be made available in instances where energy efficiency program resources are not available, or are insufficient. We recommend that the CPUC ensure the Program Administrator has the flexibility to provide funding from the Multifamily Solar Roofs program on a case-by-case basis to implement energy efficiency improvements, subject to the availability of unspent AB

693 resources from previous years. Allocating unspent funds in a given year to cost-effective energy efficiency improvements is in part required by AB 693's implementing legislation, which stipulates the energy efficiency requirement be equal to that in Public Utilities Code section 2852.[103] Public Utilities Code section 2852(c)(3), in turn, provides that unspent funds shall be allocated to cost-effective energy efficiency improvements.[104]

- *New Funding Under PUC Code Section 748.5*: Section 748.5 of the Public Utilities Code provides that: "the commission may allocate up to 15 percent of the revenues, including any accrued interest, received by an electrical corporation as a result of the direct allocation of greenhouse gas allowances to electrical distribution utilities pursuant to subdivision (b) of Section 95890 of Title 17 of the California Code of Regulations, for clean energy and energy efficiency projects…."[105] AB 693 directed the use of 10% of these resources for the Multifamily Solar Roofs Program. Should funding from available energy efficiency programs and AB 693 be insufficient to implement energy efficiency improvements under the Multifamily Solar Roofs Program, we propose that the Commission make available an additional 1-2% for efficiency improvements under the Multifamily Solar Roofs Program, from the direct allocation of greenhouse gas allowances to electrical distribution utilities pursuant to subdivision (b) of Section 95890 of Title 17.

- *Transferring ESA Program Resources:* As an additional or alternative funding source for energy efficiency improvements, we recommend that a portion of the unspent energy efficiency funds in the Energy Savings Assistance Program (ESAP) be reprogrammed for use in the Multifamily Solar Roofs program. Between 2009-2015, utilities accumulated nearly $400 million in unspent funds, a portion of which could be applied to efficiency projects under the AB 693 program.

Compliance and Documentation

As evidence of compliance with the program's energy efficiency requirements, participating owners should be required to provide the following documents:

- Energy Audit Approved Energy Improvement Plan *(provided or approved by the energy efficiency technical administrator)*
- Certification of Energy Efficiency Project Completion *(provided by property owner)*

[103] PUC Section 2870(f)
[104] PUC Section 2852(c)(3)
[105] PUC. Section 748.5(c)

XI. Energy Storage[106]

AB 693 defines a "solar energy system" as "a solar energy photovoltaic device that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code."[107] The Public Resource Code provides added clarification that,

> "Solar energy system" means a solar energy device that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782."[108]

Based on the plain language of the law, its legislative history and interpretations of the term "solar energy system" by other California and federal agencies, the definition of that term includes storage devices within its coverage. The Nonprofit Solar Stakeholders Coalition recommends that this view of the plain meaning of the statutory term be adopted by the Commission for the following reasons:

- The plain language of "solar energy system" must refer to all **balance-of-system components** of such a solar system. This obviously would include all its component parts, such as inverters and mounting structures and, increasingly, storage devices.[109]

- The law defines the term "solar energy system" under Sec. 25781(e) as "providing for the **collection and distribution** of solar energy" –a solar process relying on all balance-of-system components, including storage.

- The law's only relevant legislative history, the CPUC recognized that the law would be "significantly different from existing renewable energy programs… [and the CPUC] would need to open a new proceeding to design and establish the program rules." Specifically, the CPUC analysis stated that while the current MASH program provides incentives only to solar-electric systems, "the incentive program proposed by this bill would incentivize "qualifying renewable energy systems."[110]

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[106] Questions 8 and 9 of the ALJ's July 8, 2016 Ruling are covered in this section.
[107] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(a)(4).
[108] Public Resource Code. Section 25781(e)
[109] Under the Self-Generation Incentive Program (SGIP) nearly 500 solar plus storage projects have been supported by public subsidies in California based on the best reading of the projects funded. See SGIP Weekly Statewide Report available at https://www.selfgenca.com/documents/reports/statewide_projects.
[110] Curran, Elizabeth and Kochanowsky, Amy, California Public Utilities Commission, "Division Analysis: Multifamily Affordable Housing Renewables Program." See attached document in Appendix F.

- Other California and federal agencies interpret the plain language statutory term "solar energy system" to unequivocally include storage devices. This is so in the implementation by the California State Board of Equalization for purposes of excluding property taxes on solar installations;[111] as reaffirmed by the California Clean Energy Authority[112] while the U.S. Department of Energy defines "solar energy system" to include optional batteries as part of a typical solar balance-of-system.[113]

A legal analysis supporting the eligible of energy storage as a component of an integrated solar energy system that provides for the collection and distribution of solar energy is provide in Appendix G.

Inclusion of Storage Meets Tenant Benefit and Equity Goals of the Law

Overall, the law's purpose is to ensure that low-income tenants residing in affordable multifamily housing receive the economic benefits of both "clean energy and energy efficiency projects." This is achieved through the installation of solar energy systems, energy efficiency, and local hiring in a way that helps low-income tenants reduce their electric bills, while also achieving the other environmental and clean energy goals of the state.[114]

To meet these legislative goals, affordable housing owners and their tenants should have the same options as other utility customers to choose the clean energy technologies that

[111] California State Board of Equalization - Property and Special Taxes Department, "Guidelines for Active Solar Energy Systems New Construction Exclusion." Available at https://www.boe.ca.gov/proptaxes/pdf/lta12053.pdf

[112] Clean Energy Authority, "California Solar Rebates and Incentives: California Property Tax Exclusion for Solar Energy Systems." Available at http://www.cleanenergyauthority.com/solar-rebates-and-incentives/california/california-property-tax-exclusion/.

[113] See http://energy.gov/energysaver/small-solar-electric-systems and http://energy.gov/eere/energybasics/articles/solar-photovoltaic-system-design-basics.

[114] According to a recent study, when sited and deployed according to air quality data, energy storage (and other distributed resources) can reduce reliance on polluting peaker power plants and lower emissions in disadvantaged communities. Researchers at UC Berkeley and nonprofit research institute PSE Healthy Energy found that storage can strategically replace more polluting energy services in the areas most susceptible to poor air quality and address decades-old discrepancies in environmental justice, whereby poor neighborhoods have been more likely to sit near the dirtiest power plants. So smart placement of storage under an AB 693 incentive regime could both reduce tenant bills and improve the health of low income tenants. See Krieger, Casey and Shonkoff, "Framework for Siting and Dispatch of Emerging Energy Resources to Realize Environmental and Health Benefits: Case Study in Peaker Power Plant Displacement," Energy Policy 96 (2016) 302-311

best suit their needs now and in the future– including energy efficiency, solar, and storage. Excluding these low-income constituencies from incorporating storage devices would prevent low-income tenants and property owners in this underserved market from having equal access to the full array of solar and storage technology markets and state incentives that now principally benefit the state's high-income customers.

Having said that, the Nonprofit Solar Stakeholders Coalition's position is that AB 693 provides incentives for storage as an optional component of a solar balance-of-system, where appropriate, but storage is not required in all cases. Decisions on whether to incorporate storage with solar should be left to the affordable housing property owners and their constituencies, depending on what makes economic sense to fulfill their housing mission and provide tenant benefits with the incentive support under AB 693.

Additional Statutory Interpretation Arguments on Storage Eligibility

Other key state and federal agencies interpret the term "solar energy system" to include battery storage to meet other environmental and energy laws.

- *SB 1* – A key expectation of Senate Bill 1, as referenced in the California Energy Commission (CEC) "Guidelines for California's Solar Electric Incentive Programs," is the expectation of "optimal system performance during periods of peak demand."[115] As net grid electricity demand has decreased during sunny daytime hours, shifting peak demand periods towards early evening hours of low or no solar production is a key legislative challenge. Only storage devices can appropriately address this problem and satisfy the state's policy goal of optimizing solar for peak demand periods.

- *CPUC/CEC Policy* – The inclusion of energy storage within the definition of "solar energy system" is an express policy position of both the CEC and CPUC. CEC has established a precedent for the consideration of storage as part of a solar energy system within Section III(F) of its "Renewables Portfolio Standard Eligibility Guidebook".[116] Also, the CPUC references these energy storage policies in Decision 14-05-033, "Decision Regarding Net Energy Metering Interconnection Eligibility for **Storage Devices Paired**

[115] California Energy Commission, "Guidelines for California's Solar Electric Incentive Programs." Available at http://www.energy.ca.gov/2012publications/CEC-300-2012-008/CEC-300-2012-008-ED5-CMF.pdf.

[116] California Energy Commission, "Renewables Portfolio Standard Eligibility Commission Guidebook." Available at http://www.energy.ca.gov/2015publications/CEC-300-2015-001/CEC-300-2015-001-ED8-CMF.pdf.

with Net Energy Metering Generation Facilities".[117] (Emphasis added). Thus, the CPUC has defined a statewide goal to include storage within solar energy systems to advance the combined systems for purposes of net metering and RPS compliance goals.

- *Prior CPUC Interpretations* – The CPUC has used this exact legislative interpretation approach before in a similar incentive context question involving the Self-Generation Incentive Program (SGIP) when storage was found to be an enabling technology to other statutorily covered technologies. In 2008, Decision 08-11-044, the CPUC concluded that storage devices, although not explicitly mentioned in the statute at that time, nevertheless would be eligible for SGIP incentives as a "coupled" technology because it enhanced the value of the statutorily covered technologies for purposes of peak demand reduction. This is the same argument that should be adopted here by the PUC to allow for storage incentives "coupled" with solar under AB 693 to advance current peak demand reduction and other legislative goals. [118]

- *Department of Treasury Interpretations* – The inclusion of storage within the definition of "solar energy system" is perhaps most clearly expressed at the federal level. Existing Treasury regulations treat energy storage devices as qualifying "solar energy property" for the purposes of Section 48 investment tax credit (ITC) eligibility. Treasury Regulation § 1.48-9(d) provides that qualifying "energy property" includes "solar energy property" for the purposes of Section 48. Section 1.48-9(d)(3) states that "[s]olar energy property includes equipment that uses solar energy to generate electricity, and *includes storage devices*…and parts related to the functioning of those items."[119] An interpretation of the term "solar energy system" to exclude storage would conflict not only with these IRS tax rules but also with AB 693 Section 2870(f)(4), which requires leverage of "federal tax credits." Limiting the law to just solar generation would deprive low-income tenants and affordable housing developers of the 30 percent ITC available to reduce the costs for combined solar and storage systems.

The Solar and Storage Value Proposition: How Integrated Systems Create Greater Tenant Economic Benefits Than Alone Solar

The inclusion of storage devices in AB 693 implementation enables additional value creation through utility bill savings for low-income tenants that is greater than would be

[117] California Public Utility Commission, Decision 14-05-033, "Decision Regarding Net Energy Metering Interconnection Eligibility for Storage Devices Paired with Net Energy Metering Generation Facilities." Available at http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M091/K251/91251428.PDF.
[118] California Public Utility Commission, Decision 08-11-44, "Decision Addressing Eligible Technologies Under the Self-Generation Incentive Program (SGIP) and Modifying the Process for Evaluating SGIP Program Change Requests." Available at http://docs.cpuc.ca.gov/published/FINAL_DECISION/94272.htm.
[119] Internal Revenue Service, Treasury, "§ 1.48–9 Definition of energy property." Available at https://www.gpo.gov/fdsys/pkg/CFR-2011-title26-vol1/pdf/CFR-2011-title26-vol1-sec1-48-9.pdf

available with solar-only installations. Specifically, energy storage devices paired with solar can deliver additional bill savings for tenants (and property owners) over stand-alone solar through two avenues:

1) Reduction of demand charges for common area loads where those economic benefits can be shared by owners with tenants.
2) Shifting tenant solar energy use under time-of-use rates with storage, directly resulting in lower electric bills for tenants.

Both of these value propositions added by energy storage meet AB 693 goals to deliver the most economic benefits of solar energy systems to low-income tenants—in ways that solar-only systems without storage cannot provide now or in the future.

Reduction of Demand Charges

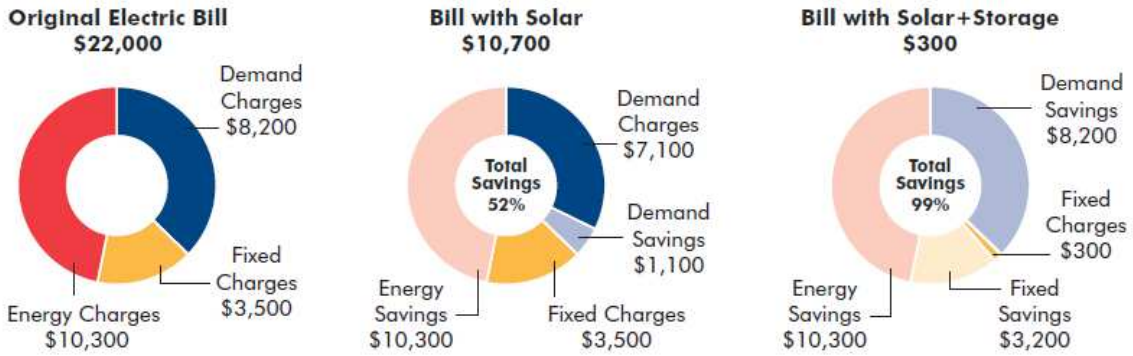
The reduction of demand charge expenses for common area loads provides property owners with the ability to dramatically reduce their overall electric bills, providing them with greater incentive to install solar energy systems [120] and new opportunities to share those savings with low-income tenants. Quantitative economic evidence of these savings is presented in the report "*Closing the California Clean Energy Divide: Reducing Electric Bills in Affordable Multifamily Rental Housing with Solar+Storage.*"[121]

The report finds that it makes economic sense today for many affordable rental housing properties in California to include storage in solar installations. In fact, storage was found to improve the economic return of a solar energy system across all of California's investor-owned utility jurisdictions. In some cases, adding storage could virtually eliminate common area electric bills, nearly doubling the bill savings of stand-alone solar at about a third of the installed

[120] It goes without saying but deserves repeating that no benefits for low-income tenants will be derived under AB 693 unless affordable housing owners have the correct incentives to install solar energy systems that can generate those tenant savings. AB 693 is an incentive program, not a mandate. Unless housing developers can see some savings from these systems and otherwise find ways to finance these systems, there will be no projects and thus no opportunities to share economic benefits with their tenants.

[121] California Housing Partnership, Center for Sustainable Energy, Clean Energy Group, and Geli, "Closing the California Clean Energy Divide: Reducing Electric Bills in Affordable Multifamily Rental Housing with Solar+Storage." Available at http://www.cleanegroup.org/ceg-resources/resource/closing-the-california-clean-energy-divide/.

cost. As shown in the figure below, a typical affordable housing property in Southern California could increase annual common area savings from $11,400 with solar-alone to $21,700 with solar and storage, resulting in an annual electricity bill of about $300.[122]



Source: Clean Energy Group

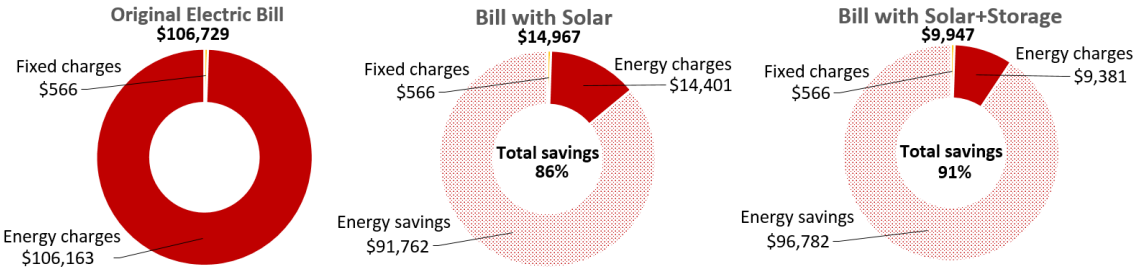
To meet AB 693 goals, there are a number of ways to ensure tenants directly share in these common area savings. For some properties, more of the solar portion of the integrated solar energy system can be allocated to directly offset tenant electricity consumption than would be feasible without storage, which is particularly important for multi-story buildings and those located in dense urban areas. Other properties may choose to adopt a shared savings model, under which tenants are directly allocated a portion of the common area demand charge savings. These and other measures can be developed with input from affordable housing property owner representatives and organizations representing the interests of low-income tenants. In any case, once established, this program should establish clear metrics that would lead to the adoption of administrative approaches to ensure primary tenant benefits through these mechanisms.

[122] Of course, not all affordable housing properties will have the load characteristics to achieve these savings. That is the point of making storage an eligible, but not mandatory, component under AB 693. These are complex questions that property owners should be responsible to explore based on their utility bills and property needs. Any incentive scheme should let them develop the best combination of technology solutions –including energy efficiency, solar and storage – creating the best business case using available AB 693 incentives and other available sources of funding, including federal tax credits for solar and storage systems.

Shifting Tenant Solar Energy Under Time-of-Use Rates.

The second avenue for tenant bill reduction after sharing demand charge savings through solar and storage is taking advantage of ways to reduce time-of-use (TOU) rate impacts. Under various state energy policy changes, TOU rates will soon be applied to all California residential utility customers. Solar customers are already being transitioned to TOU rates, and default TOU rates will be introduced for all residential customers in 2019, including CARE customers. As a result, low-income tenants living in affordable rental housing will have the opportunity to directly benefit from the incorporation of storage devices through the ability to shift the consumption or export of solar energy from periods of low electricity pricing to periods of high electricity pricing.

New information from the above-referenced report shows that solar time-shifting through adding storage can result in lower tenant electricity bills and maximize the value of solar system investments. That is, this time-shifting and TOU related bill reduction results only if storage is added to the solar installation. These results are for an illustrative affordable housing property with 75 units, and assumes tenants are on a current Southern California Edison (SCE) residential TOU rate tariff. Adding storage increases annual tenant solar bill savings by more than $5,000 per year. These additional savings represent a direct benefit to tenants that would not be available without the inclusion of storage devices.



Source: Geli/Clean Energy Group

Adding storage to solar results in two additional ways to deliver bill savings under current electric rate tariffs and reduce tenant energy expenses under AB 693 on top of savings from a solar-only system. First, based on the new analysis, tenants could share in over $10,000 in additional utility bill savings from reducing demand charges on common area loads. Second,

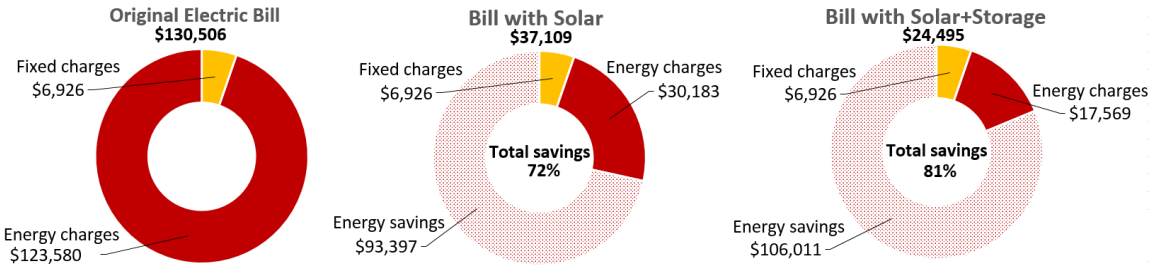
tenants could benefit directly from the additional $5,000 or more in savings annually from adding storage to a stand-alone solar system. Thus, adding storage to an illustrative building under current tariffs can result in more than $15,000 per year in additional savings available to share with tenants under the law. Over the likely lifetime of such projects, such additional savings could total over $200,000 in electric bill savings that would be available to share with tenants for this single representative project alone – but only if storage is added to solar systems.

Future Economic Opportunities for Solar and Storage

Additional opportunities for bill reduction through combined solar and storage will become increasingly important as new policies come into place in California. Distributed energy resource market opportunities, NEM policies, and utility rate tariffs will all evolve over the lifetime of the implemented multiyear program.

To protect tenants from changes that could negatively impact the value proposition of solar and include them in California's energy transition, AB 693 should be geared to leave every pathway open to providing value to low-income customers.

To assess that future scenario and how storage could mitigate against harm to low-income tenants, it is important to look at the economic analysis of potential tenant electric bill savings enabled by storage under expected future solar policy scenarios. The analysis below is based on piloted future TOU rates proposed by SCE, where peak periods have shifted to later in the day when solar PV is not generating electricity. Adding storage increases annual tenant bill savings by nearly 10 percent, resulting in an additional $12,600 in direct tenant savings per year.



Source: Geli/Clean Energy Group

Adding this to the $10,400 in savings achieved through demand charge reduction, an affordable rental housing property with 75 units in southern California would realize an additional $23,000 in annual savings, representing over $300 in savings per unit each year that would not be available without storage. Under this predicted future scenario, storage would add over $300,000 in electric bill savings to a solar installation over the projected lifetime of the project.

These economic justifications do not imply that energy storage is right for all multifamily affordable housing properties. In cases where similar utility tariffs and other conditions apply, combining storage with solar results in more economic savings available to affordable housing properties under AB 693 than simply providing incentives to stand-alone solar.

As with solar-only systems, solar energy systems incorporating storage should be implemented in a way that ensures the system primarily benefits affordable housing tenants. Accordingly, the decision on whether to incorporate storage with solar should be left to the affordable housing property owners and their constituencies, depending on what makes economic sense to fulfill their housing mission and provide tenant benefits with the incentive support under AB 693.

Energy Storage Incentives

Storage devices, while an integral part of many solar energy systems, are a very different type of technology than solar, with unique capabilities and separate cost trajectories. Due to these differences, a separate incentive structure should be adopted for the storage portion of a solar energy system. However, inclusion of a storage device in a solar energy

system should not alter the proposed incentive structure for the solar portion of the project. We recommend that the following incentive structure for solar energy systems that include storage devices:

- *Solar Incentive*. Incentives for solar PV panels and balance-of-system components, excluding storage devices, should remain at the proposed incentive level for a solar energy system regardless of the inclusion of storage. Instead, we recommend offering a separate incentive for storage (see below).

- *Storage Incentive with Modified Stepdown.* There should be a separate incentive structure defined specifically to apply to the storage portion of a solar energy system. A good basis for setting the initial incentive level for storage devices can be found in the recent CPUC proposed decision revising the SGIP.[123] The decision proposes the adoption of incentives for advanced energy storage technologies at an initial level of $0.50 per watt-hour for storage systems greater than 10 kilowatts and $0.60 per watt-hour for systems of 10 kilowatts or smaller, with a four subsequent steps reducing the incentive by $0.05 per watt-hour at each step. Setting the same storage incentive structure for storage devices under AB 693 should catalyze investment in storage technologies without overly subsidizing the technology.

  While it makes sense to base the storage device incentive on the structure defined in the SGIP decision, the step down in incentive levels should not necessarily follow the same timeline. Like solar, storage development for the affordable housing sector, which is more complex market due to complicated financing structures and split incentives, requires a slower decline in incentive levels than for the larger California market. The storage incentive level should be periodically reviewed by the program administrator and adjusted as necessary.

- *Cap for Solar Energy System Incentive*. The total solar energy system incentive available under AB 693, inclusive of both solar and storage incentives, for any project should not exceed 100 percent of the installed system cost, adjusted for other sources of funding, for portions of the system providing economic benefits to tenants and should not exceed 70 percent of the installed system cost, adjusted for other sources of funding, for portions of the system providing economic benefits to common areas.

[123] California Public Utilities Commission, "Decision Revising the Self-Generation Incentive Program Pursuant to Senate Bill 861, Assembly Bill 1478, and Implementing Other Changes." Available at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M162/K005/162005693.PDF.

Additionally, boundaries should be set on system sizing to ensure the incentive structure promotes deployment of storage systems designed to optimize economic return for both common area and tenant loads. Each storage system would have two sizing constraints: *Power (kilowatts)* and *Duration (hours)*.

- *Power.* For common area loads, the primary economic opportunity for storage is currently through peak demand reduction. Because of this, the portion of a storage device sized to target common area loads should be limited to a rated power of no greater than a property's anticipated peak demand.

  For tenants, the primary economic opportunity for storage is currently through energy time-shifting, also known as energy arbitrage. Due to the goal of AB 693 to deliver tenant benefits through deployment of solar energy systems, storage devices designed for tenant energy time-shifting should be limited in rated power to the rated power output of solar system deployed for direct tenant benefits. In this way, the storage device will be sized appropriately to shift solar generated energy as well as have an opportunity to take advantage of available federal investment tax credits for solar energy system components.

  A storage device designed for both common area and tenant benefits should have a total power rating of no more than the combined total of anticipated peak common area load and rated power output of solar designated to directly benefit tenants.

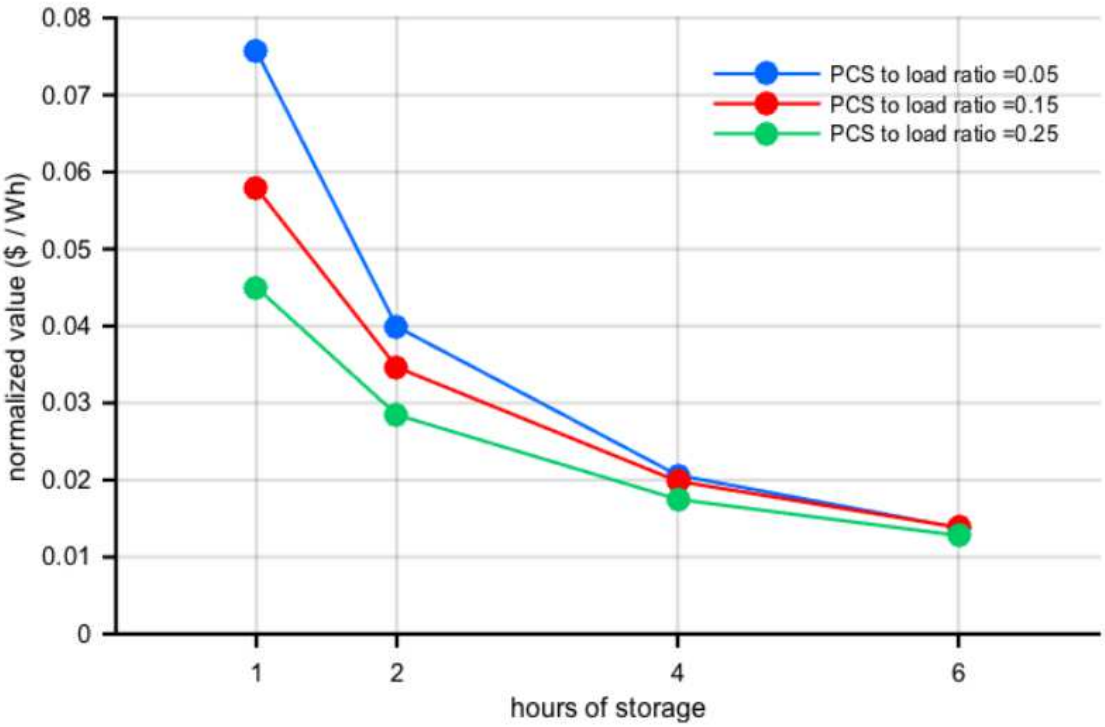
- *Duration.* Based on an analysis of nine California affordable housing properties, optimal duration for common area peak demand reduction in affordable housing ranged from 1.5 hours to 3 hours, with an average duration of 2.6 hours.[124]

  This is consistent with analysis by Geli that was included in comments submitted by the solar industry group CALSEIA regarding the May 16th, 2016 CPUC proposed decision to revise SGIP.[125] The figure below, which was included in CALSEIA's comments to the CPUC, illustrates that the value of demand charge mitigation begins to drop off at the 2-hour duration point and significantly declines after 4 hours.

[124] California Housing Partnership, Center for Sustainable Energy, Clean Energy Group, and Geli, "Closing the California Clean Energy Divide: Reducing Electric Bills in Affordable Multifamily Rental Housing with Solar+Storage." Available at http://www.cleanegroup.org/ceg-resources/resource/closing-the-california-clean-energy-divide/.

[125] California Solar Energy Industries Association, "Comments of the California Solar Energy Industries Association on the Proposed Decision on Reforms to the Self-Generation Incentive Program." Available at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M163/K152/163152824.PDF

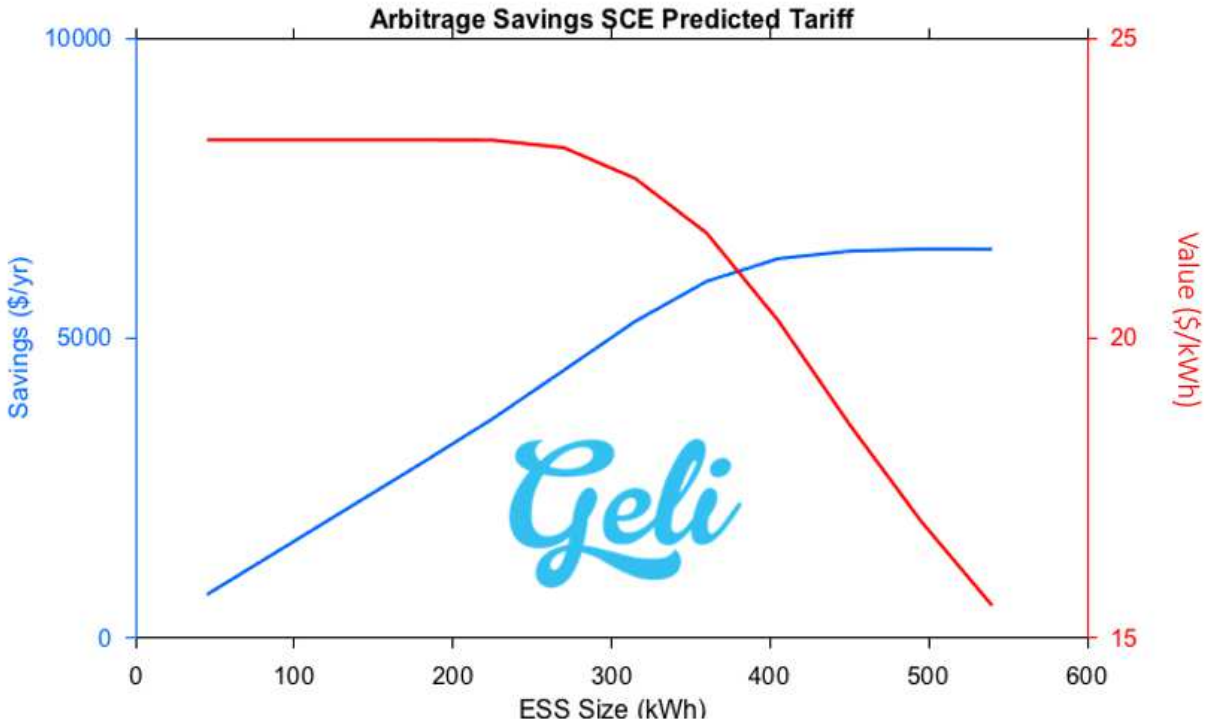
Figure 1. Geli Analysis of Customer Value for Demand Charge Mitigation



Source: California Solar Energy Industries Association, Geli

An analysis by Geli of the value proposition for storage devices performing residential energy time-shifting came to a similar conclusion. The figure below shows the energy arbitrage value proposition of a 120 kW storage device shifting solar energy to impact affordable housing tenant loads under a predicted future Southern California Edison TOU rate tariff. At about 300 kWh, or a storage duration of 2.5 hours, the value in dollars per kilowatt hour begins to decline more rapidly and savings begin to level off. A similar inflection point was found for tenants under PG&E and SDG&E TOU rate tariffs.

Figure 2. Geli Analysis of Energy Storage Savings (ESS) Size vs. Savings



Source: Geli, Clean Energy Group

Based on these results, it is recommended that storage device duration incentivized under implementation of AB 693 be limited to no more than 3 hours. So that, for example, a storage device with a power rating of 100 kW be limited to a capacity of no more than 300 kWh. These power and duration constraints should allow for optimal system design, while discouraging uneconomic oversizing of storage devices.

XII. Program Administrative Structure[126]

AB 693 requires the Commission to put in place an appropriate administrative structure to implement the Multifamily Solar Roofs Program. To determine what administrative structure is most appropriate, AB 693 directs that:

> The commission shall consider the most appropriate program administration structure, including administration by a qualified third-party administrator, selected by the commission through a competitive bidding process, or administration by an electrical corporation, in an existing or future proceeding.[127]

The decision on whether to select a third-party administrator or administration by an electrical corporation should take into consideration a number of factors, including those described below.

Alignment of Mission

The administrative structure must be compatible with, and capable of directing, a market transformation through the delivery of a comprehensive menu of energy services and investments that are provided in a manner both responsive and sensitive to the energy needs of property owners and low-income renters. To accomplish this, there must be a seamless alignment between the mission of the Program Administrator and the mission of the organizations owning and operating the affordable housing, the organizations representing the interests of the low-income tenants residing at these properties, and other stakeholders of the program.

Capacity to Provide Administrative Support to Meet All Requirements

As discussed in Section 2 of this Joint Proposal, the Program Administrator will be required to carry out a number of technical and support functions that were not conducted under MASH and that are unique to the Multifamily Solar Roofs Program. These include:

[126] Questions 10,17,24 and 25 of the ALJ's July 8, 2016 Ruling are covered in this section.
[127] Cal. Pub. Util. Code § 2870(d).

i. Ensure that the program incentives are aligned with program costs and account for leveraged resources so that "no individual installation receives incentives at a rate greater than 100 percent of the total system installation costs."[128]
ii. Ensure compliance with geographic diversity requirements.[129]
iii. Provide outreach and technical assistance in disadvantaged and underserved communities to address barriers to accessing renewable energy.
iv. Ensure compliance with requirements that PV generation is primarily allocated to tenants and that utility tariffs provide a direct economic benefit to tenants.[130]
v. Monitor and ensure compliance with local hiring.[131]
vi. Provide technical support and facilitate "one-stop" access to utility energy efficiency program resources to implement energy efficiency requirements.[132]
vii. Develop protocols and verify compliance with system performance and operation and maintenance requirements.[133]
viii. Conduct analysis and market demand assessments.[134]

The previous IOU administrative model developed for programs such as MASH is not sufficient to meet the demands and challenges of a program as complex as AB 693 and the needs of a housing market that to date has been largely underserved by ratepayer energy programs. In particular the MASH IOU model would be structurally unable to ensure compliance with geographic diversity requirements and it would lack the efficiencies and capacity to perform most of the other key tasks listed above.

Administrative Efficiency, Consistency, and Flexibility

Requiring multiple administrative staffs, and replicating administrative processes, marketing plans, local hiring plans, and compliance protocols multiple times, for each electrical corporation, would unduly add to administrative cost. Since many of administrative support functions are fixed cost, a structure with multiple administrators will present difficulties and constraints within the budget limits set for the program. Such budget constraints could

[128] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(4) an(5).
[129] AB 693. Section 1(e).
[130] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(2) and (g)(2)
[131] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(6)
[132] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(7).
[133] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(f)(3).
[134] AB 693 amendments to PUC. Part 2 of Division 1 of the PUC, Section 2870(j)(1) and (2).

adversely affect the delivery of support or technical services to program stakeholders to address barriers and build capacity to implement energy efficiency improvement and install solar energy systems.

Multiple administrators, each with their own staffs and administrative processes, would add complexity and administrative burdens for property owners, who would have to access the program at multiple points, navigate slightly different implementation protocols and practices, and respond to requests to multiple administrators to implement their projects. Focus groups of property owners conducted by Coalition members have shown conclusively that these inefficiencies and burdens would have a chilling effect on participation rates by these property owners and doom the Program to failure. Multiple program administrators would also contribute to differences in the level and quality of services provided to support the program. Uneven outreach or technical support might also result, and adversely affect program participation and compliance with geographic diversity requirements or delay implementation. Property owners require certainty, consistency, and simplicity in the administration of programs, especially one as complex as the Multifamily Solar Roof Program, to secure their participation.

In summary, the scope and complexity of AB 693 requires a single point of entry and the coordinated delivery of administrative support and technical services instead of replicating administrative processes multiple times.

Need for Single, Statewide Administrator

The Nonprofit Solar Stakeholders Coalition recommends and proposes that a third-party statewide Program Administrator be selected to administer the Multifamily Solar Roofs Program. There are several key benefits to this administrative structure that would result in a more successful program and provide the maximum benefits to low-income tenants than traditional IOU administrative structures.

First, IOUs have not achieved desired levels of penetration for other low-income programs such as the CARE and Energy Savings Assistance Programs (ESAP).[135] In this regard, considerable efforts have been made to expand energy efficiency services for multifamily affordable housing properties under the ESAP. These efforts have been largely thwarted in the Commission's proceeding, contributing to lower program participation by renters and multifamily property owners.

As evidence, the Coalition points to the general energy efficiency proceeding, where the problem statements provided by PG&E, SDG&E, and SCE for their business plans have largely concluded that multifamily properties are "hard to reach" and are "limited in their efficiency improvement opportunities" because of "split incentive" issues and that "only a subset have high potential for energy efficiency savings." IOU Program Administrators have also suggested that multifamily energy efficiency programs have low participation because of low rates of return. SCE observed that "energy efficiency is a relatively low priority for multifamily property owners, like all businesses, they have many demands on their resources."

These generalizations are not applicable to all segments of the multifamily market. Some segments of the multifamily market have been engaged in energy efficiency strategies and segments of affordable housing markets include planning and housing quality requirements that target energy efficiency improvements, subject to the availability of funding. Such misunderstandings about multifamily housing markets ultimately undermined the effectiveness of ratepayer programs with respect to this market segment.

In contrast, the LIWP Large Multifamily program, funded by Cap and Trade allocations, offers a model of a successful statewide, third-party administered program that, unlike IOU programs, provides a one-stop delivery mechanism integrating support and technical services and energy funding resources to facilitate combined energy efficiency and solar improvements. This program, launched in 2016, has been successful in recruiting multifamily property owners in undertaking comprehensive energy improvements and has even come to the aid of MASH projects that have been stalled because of an inability to cover costs for residential installation.

[135] *See* CPUC, Low-income Oversight Board, Draft Meeting Minutes, pp. 7-8 (Feb. 23, 2016), *available at* http://www.liob.org/meetings.aspx.

The LIWP Large Multifamily demonstrates how statewide third-party managed and administered programs can introduce new service concepts and comprehensive solutions for serving multifamily markets, not possible within traditional IOU business models.

Transferable Administrative Requirements and Processes

A number of core administrative processes requirements must be developed to implement the program. For example, there are some features of the MASH program that are readily transferable and useful to the implementation of AB 693. These include state licensing requirements for solar contractors, PV equipment eligibility, warranty and system performance requirements, and inspection requirements.

Non-Transferable Administrative Requirements

There are also a number of requirements from the MASH program that are not transferable and should be substantially revised under the Multifamily Solar Roofs Program. These include:

- *Application and Reservation Process:* The MASH application and reservation has contributed to several undesirable outcomes. Program reservations have been monopolized by a relatively small group of solar contractors. These practices are evident by the short time period in which IOUs opened up their wait lists to accept new applications. When wait lists were opened, these solar providers made mass reservations, in some cases enrolling multiple properties within a housing organization's portfolio. The current administration of this process also permitted properties on a wait list to be substituted with other properties owned by the same housing organization if it was decided that the proposed solar project was not viable. This loophole encouraged solar providers to over-enroll and over size properties at the front end until project interest or viability was actually determined. The result of these practices was the exclusion of other multifamily property owners from applying for and participating in the program.

To address this problem, the Coalition recommends the following corrective actions are necessary:

i. Discontinue the practice of allowing solar companies to enroll multiple properties for a property owner at one time.
ii. Require that multifamily property owners make direct project applications.

iii. Establish a process to phase application approvals on a quarterly basis
iv. Set a limit on project reservations that a housing applicant can receive during a quarter
v. Provide property owners with conditional (60day) reservations to permit housing organizations to obtain competitive bids from multiple solar contractors before locking in reservations

- *Reservation Period:* For projects with LIHTC funding, the reservation period must be extended to 36 months, consistent with the requirements in the New Solar Home Partnership program, to fit with the project development cycle for these projects.
- *Energy Efficiency:* The MASH energy efficiency requirements should not be adopted for the Multifamily Solar Roofs Program. The energy efficiency requirements proposed in Section X should be adopted.
- *Incentive Limitations*: AB 693 specifies additional incentive limitation requirements that must be addressed.
- *Payment Designation*: Payment under AB 693 should be made directly to the property owner, not the solar installer, to ensure project accountability.

New Requirements and Processes

There are a number of new areas that should be addressed in the administrative guidelines for the Multifamily Solar Roofs Program, including:

- *Consumer Protections*: Additional consumer protection are necessary to ensure that property owners and tenants have accurate and reliable information concerning the solar system, system costs, energy savings benefits, operations and maintenance cost, and assumptions used to project out-year energy savings and costs.
- *Operation and Maintenance:* Guidance is needed to address system monitoring and O&M requirements for TPO installed systems.
- *Performance Guarantees*: Guidance is needed to address system performance/production guarantee requirements for TPO installed systems.
- *Energy Storage*: Guidance is needed on energy storage equipment standards and protocols.

Data and Reporting

Greater transparency should be provided for the Multifamily Solar Roofs Program than was provided for the MASH program. For the public to review the performance and outcomes of the program, a greater level of information on the participating properties and installed solar energy systems is needed.

- *Project Data Elements*: Data elements available to the public should include:
  i. Property name and address
  ii. Number of residential units
  iii. Property Type (LIHTC, HUD-assisted, PHA, USDA-RD)

iv. Property electricity use (aggregated pre-solar baseline
v. Solar energy system ownership (Property, TPO)
vi. Solar energy system incentives (residents, common area)
vii. Solar energy system details (PV/storage size, costs, panels, inverters, contractor)
viii. Solar energy system allocation (residents, common area)
ix. Solar energy system financial projections (estimated energy savings for residents, common area)
x. Date installed
xi. Energy efficiency reduction estimate/goal for property

- *Geographic Data Elements (by Census Tract)*
  i. Solar systems installed, under reservations, pending applications
  ii. Solar capacity installed, under reservations, pending applications
  iii. Low-income renters receiving solar benefits
  iv. CARE eligible customers reached by program
  v. PV generation allocated to offset tenant usage
  vi. Number of local hires from solar projects.
  vii. GHG emission reductions.

- *Data Disclosure and Transparency*: The Commission should revise policies concerning the disclosure of program information on multifamily properties receiving incentives under the Multifamily Solar Roofs Program.

  Under the MASH program, information about project applications, property names and addresses were not made available in the California Solar Initiative public database. Additionally, staff has denied request for this information from nonprofit, public advocacy organizations. The lack of transparency has hampered efforts by organizations to evaluate the programs use by housing organizations, tenant coverage of installed systems, and the amount of MASH installations within DAC and other underserved communities.

  Moreover, there is no apparent policy rational that would prevent the release of this information. Affordable multifamily rental properties receiving housing financial assistance and subject to deed restrictions and regulatory agreements, such as those properties funded by MASH, are already included in public databases. These databases include information on property name, address, and type of pubic assistance received by the property.

  We recommend that the same level of transparency be provided for the Multifamily Solar Program.

Safety Issue

The ALJ has requested comments on what safety issues should be considered in the implementation of the program, and who should be responsible for meeting any safety requirements. The central safety issues affecting program implementation concern the installation of the solar energy systems and the ongoing operation and maintenance of the installed equipment.

With regards to installation, matters of site and worker safety should be the responsibility of the solar contractor. Moreover, the installed system should be free from defect that would pose safety risks to the tenants or property owners. These responsibilities are, and should be, delineated in written agreements between the solar company and the property owner. Furthermore, the solar contractor should provide employees with appropriate worker safety training and have appropriate liability and workers compensation insurance in the event of an accident.

With regards to the ongoing operations of the solar systems, the operation of the equipment is generally the responsibility of the owner of the solar energy system. Accordingly, if the solar energy system is owned by a third-party owner, the responsibility for ensuring that the system's operations is safe and poses no risk to the tenants lies with the third party owner. In this regard, the third-party owner should be expected to have appropriate liability and property insurance.

XIII. Conclusion.

AB 693 presents an unprecedented opportunity for California to deliver a comprehensive and integrated energy strategy that materially advances California's energy policies and goals across a market segment that is often underserved by existing energy programs. Through the structure and elements presented in the Joint Proposal, the CPUC can realize the twin goals the Legislature clearly communicated in passing AB 693: to help low-income households residing in affordable multifamily housing realize savings on their electric bills, savings that could mean not having to choose between heat and food on the table, while also furthering the state's greenhouse gas reduction goals.

The Joint Proposal accomplishes the twin goals of AB 693 by developing incentive structures that directly benefit low-income tenants while adequately incentivizing building owners to participate, creating effective energy efficiency requirements, and reducing peak demand with solar plus storage. The Joint Proposal also provides a framework for achieving more robust job placement requirements to achieve long-term and good paying jobs for residents of low-income and disadvantaged communities and targets disadvantaged workers and communities most in need of economic development opportunities. The program design also creates a more equitable solution for project distribution by eliminating the first-come, first-serve approach under MASH and proposes criteria for achieving equitable investments in low-income and disadvantaged communities. Most importantly, the Joint Proposal recommends that the Commission engage a single third-party statewide program administrator to achieve greater efficiency, consistency, and more targeted outreach to the complicated and significantly underserved affordable housing market segment.

In developing the Joint Proposal, the members of the Nonprofit Solar Stakeholder Coalition and our constituents have been strongly influenced by a desire not to replicate past failures or ignore opportunities to leverage successes. We have, in the end, sought to articulate

a framework capable of addressing the long-term energy needs of our state's most vulnerable households and communities consistent with the mandates of AB 693.

The Joint Parties urge the Commission to adopt the program design presented in the Joint Proposal to ensure that low-income renters and the communities they reside in have access to a full range of solutions that their energy future depends on.

Respectfully submitted this 3rd day of August 2016, San Francisco California.

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Rulemaking 14-07-002

PROPOSAL FOR THE IMPLEMENTATION OF AB 693
APPENDICES

Nonprofit Solar Coalition
Joint Submission

August 3, 2016

APPENDICES