

# Facilitating Building Decarbonization through Utility Allowances

**An Electric Program Investment Charge (EPIC) Report  
for the California Energy Commission (CEC)**

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# CALIFORNIA HOUSING PARTNERSHIP

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The State Legislature created the California Housing Partnership (the Partnership) in 1988 as a private nonprofit organization with a public mission: to help preserve and expand California's supply of affordable homes and to provide leadership on affordable housing policy and resource issues. The California Housing Partnership is unique in combining on-the-ground technical assistance with applied research and policy leadership at the state and national level to increase the supply of affordable homes. In the past three decades, the Partnership has helped more than a hundred California nonprofit and government housing agencies leverage \$25 billion in public and private financing, resulting in the creation or preservation of more than 75,000 homes affordable to low-income Californians.

The Partnership's Sustainable Housing team works directly with nonprofit affordable housing providers and public housing authorities to help them evaluate and finance clean energy and water improvements. This involves educating owners about the programs and opportunities for incentives available to them, as well as developing innovative demonstration projects to explore new technologies, financing tools, and business models for affordable rental homes. The Partnership's Sustainable Housing team is leading efforts to ensure that nonprofit affordable housing providers and residents are able to participate in California's path towards equitable decarbonization.

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# INTRODUCTION & OVERVIEW

California's climate policy over the last three years has shifted significantly to focus on removing fossil fuel end uses from buildings. To this end, fifty three cities and jurisdictions across California have committed to phasing out fossil fuel appliances in new construction.<sup>1</sup> Further, agencies like the California Air Resources Board (CARB) and Bay Area Air Quality Management District (BAAQMD) are planning to phase out appliances that emit nitrogen oxide, as it increases asthma risk and leads to premature deaths.<sup>2</sup> To meet these goals, the State of California has invested significant dollars to fund this transition, especially for lower income residents.<sup>3</sup> However, financing – especially gap financing – remains a huge barrier for rent-restricted multifamily affordable housing owners/providers (housing providers) in making the transition to all-electric buildings across their portfolio.

One of the most pressing challenges in electrifying multifamily housing is the issue of split incentives for housing providers, which occurs because housing providers face many difficulties trying to finance electrification but are unable to recover electrification costs through adjusted rents.<sup>4</sup> Although housing providers want to prioritize the health, comfort and safety of residents by transitioning to all electric buildings, they encounter challenges that make these initiatives infeasible or prohibitive. For new construction, electric equipment and installation costs are comparable to equivalent gas technologies, but for existing buildings, electric equipment has higher procurement, installation and operating costs.<sup>5</sup> Utility allowances can help address this issue, but during the California Housing Partnership's 2020 Affordable Housing Building Decarbonization Summit (Summit I), housing providers expressed uncertainty around how utility allowance calculation methods may affect their operating income and residents' energy burden.<sup>6</sup> In response, the second summit – held in 2021 (Summit II) – included a panel on this topic to examine the impact of utility allowances on affordable housing electrification.

## What is a Utility Allowance?

In multifamily affordable housing, residents might have to spend a large percentage of their income on utility bills. The utility allowance (UA) is a reasonable estimate of their bills and is intended to alleviate residents' utility costs. The total or gross rent for the unit restricted under affordable housing programs includes the rent residents actually pay to the landlord (net rent) and the required UA amount. Due to this relationship, when UAs are high, rent is lower and vice versa. UAs that are higher than residents' actual utility bills present a challenge for housing providers who are trying to electrify, due to the split incentives. If UAs are not changed after electrification upgrades, housing providers are discouraged from installing electrification technologies because they cannot recover their upgrade costs from the utility savings to the residents.

*Figure 1: Relationship between utility allowances and amount residents pay to landlord (net rent)<sup>7</sup>*



*\* Note: In HUD and RD Rental Assistance programs, the "Total Tenant Payment" is supplemented by a housing assistance payment to reach the total "contract rent" for the unit.*

## INTRODUCTION & OVERVIEW, cont.

### How are Utility Allowances Calculated?

There are several methods multifamily affordable housing providers can use to calculate utility allowances. These methods can be consumption-based, engineering-based, or based on a set UA schedule provided by the local public housing authority (PHA). Consumption-based methods involve using residents' actual utility bill data to calculate allowances, while engineering-based methods rely on creating an engineering model of the building(s) to estimate energy consumption before converting to estimated utility bills.

In California, housing providers mostly use either the UA schedules provided by the local PHA or the California Utility Allowance Calculator (CUAC):

- The PHA schedule is the more commonly used, prescriptive method. Each PHA is specific to a city or county and has its own UA schedule. The U.S. Department of Housing and Urban Development (HUD) sets rules and guidelines for how PHAs should calculate their UA schedules.
- The CUAC is a project-specific, engineering-based method and is tied to the modeled energy usage of certain appliances and technologies. The California Energy Commission (CEC) provides the CUAC software, while the California Tax Credit Allocation Committee (TCAC) sets the rules for its usage.

In addition to these two methods, providers can also use their own utility bill data or engineering models to calculate UAs. They can either perform the calculations internally or outsource this work to a third party consultant. Whether internal or through a consultant, calculating UAs in this manner is significantly less common than using the PHA schedule or CUAC.

Providers are not always able to choose between methods, as some housing finance programs restrict which UA calculation method housing providers can use. This table summarizes types of UA calculation methods and which housing finance programs permit their usage.

*Figure 2: Summary of allowable utility allowance methods under federal housing finance programs<sup>8</sup>*

Method	Description	Applicable Federal Program
<b>Utility Allowance Schedule</b>	<ul style="list-style-type: none"><li>• Set by the Public Housing Authority</li><li>• Rough estimate of reasonable consumption</li><li>• Sometimes based upon HUD's Utility Schedule Model</li><li>• Not usually based on project-specific energy characteristics or performance</li><li>• Could include a separate schedule for more efficiency, e.g., Energy Efficiency-Based Utility Allowance (EEBUA)</li></ul>	<ul style="list-style-type: none"><li>• LIHTC</li><li>• Section 8 Vouchers</li><li>• Project-Based Vouchers</li><li>• Public Housing</li></ul>
<b>Actual Consumption Data</b>	<ul style="list-style-type: none"><li>• Calculated by owner or consultant</li><li>• Project-specific</li><li>• Based on billing data</li></ul>	<ul style="list-style-type: none"><li>• Project Based Rental Assistance (PBRA)</li><li>• USDA Rural Development (RD) Rental Assistance</li><li>• HOME</li><li>• Public Housing</li><li>• Low Income Housing Tax Credit (LIHTC)</li></ul>
<b>Energy Consumption Model (ECM)</b>	<ul style="list-style-type: none"><li>• Engineering-based estimate of reasonable consumption</li><li>• Calculated by expert</li><li>• Project-specific</li></ul>	<ul style="list-style-type: none"><li>• Low Income Housing Tax Credit</li><li>• Certain Federal Housing Authority (FHA)-insured Mortgages with PBRA</li><li>• HOME</li><li>• USDA RD Rental Assistance</li></ul>

## INTRODUCTION & OVERVIEW, cont.

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### Why Do Utility Allowances Matter for Electrification?

An optimal utility allowance calculation method can help reduce the split incentive by lowering the UA to reflect electrification upgrades without inadvertently penalizing residents with rents that are higher than they need to be. Some UA calculation methods allow for lower UAs after electrification upgrades, but housing providers are not always able to use these methods. Possible barriers to usage include cost, time commitment and regulations from the Tax Credit Allocation Committee (TCAC) and HUD. To help housing providers navigate different UA options, in 2016 the Partnership published a guide that describes each option and highlights some of the issues housing providers may encounter while using each option.<sup>9</sup>

In more recent years, housing providers have become interested in electrification, both to increase resident comfort and safety and to address climate change and pollution through building decarbonization. State, local and regional policies are also driving the electrification of multifamily affordable housing. This shift requires newer technologies, such as heat pumps for water and space heating. However, not all UA methods have been updated to incorporate these newer technologies. The key challenge is updating utility allowance policies and guidelines to incentivize electrification, without adversely affecting residents. Changing outdated UA policies and guidelines can help reduce the split incentive issue and decrease the financial barriers to affordable housing electrification.

The Summit II panel on utility allowances examined policies and guidelines relating to PHA schedules and the CUAC, as these are the two methods most frequently used by housing providers in California. The Partnership provided recommendations for each of these methods that address how changes to UA policies and guidelines can incentivize electrification without adversely affecting affordable housing residents.

# PUBLIC HOUSING AUTHORITY UTILITY ALLOWANCE SCHEDULES

## How It Works

The utility allowance schedule provided by the local public housing authority (PHA) is the more straightforward and commonly used UA calculation method in California. HUD guidelines, most recently updated in May 2020, allow PHAs to calculate UA schedules in two ways: the consumption-based methodology, or the engineering-based methodology.<sup>10</sup> The consumption-based methodology uses actual consumption data from the PHA's existing housing stock. The engineering-based methodology involves constructing a building energy model for each unit type in an average building. The unit types are distinguished by the number of bedrooms. Since PHAs are not currently required to publish their methodology for UA calculations, it is unclear which approach a particular PHA uses to calculate its schedules.

An example schedule from the Sacramento Housing and Redevelopment Agency is provided below. PHAs can provide schedules for different building types, such as apartments, townhouses and single family homes. The utility or service type relates to different energy end uses in the building, such as space heating and cooking. For each of these service types, there is a choice for the fuel type, such as gas or electric. The allowance for a particular end use, such as electric space heating, is the value along that row which matches the number of bedrooms in the unit. This method is used to find the UA value for each end use, and these values are summed to calculate the total UA for a particular household. Appendix 1 includes an example calculation of a UA estimate from a PHA schedule.

Figure 3: Standard utility allowance schedule from the Sacramento Housing and Redevelopment Agency<sup>11</sup>

Locality: <b>Sacramento Housing and Redevelopment Agency, CA</b>		Unit Type: <b>Apartment/Walk Up</b>					
Utility or Service:		0 BR	1 BR	2 BR	3 BR	4 BR	5 BR
		Monthly Dollar Allowances					
<b>Heating</b>							
a. Natural Gas (includes Climate Credit)		\$13.00	\$16.00	\$18.00	\$20.00	\$22.00	\$24.00
b. Bottle Gas/Propane		N/A	N/A	N/A	N/A	N/A	N/A
c. Electric		\$11.00	\$13.00	\$16.00	\$19.00	\$22.00	\$26.00
d. Oil		N/A	N/A	N/A	N/A	N/A	N/A
<b>Cooking</b>							
a. Natural Gas		\$3.00	\$3.00	\$6.00	\$7.00	\$9.00	\$10.00
b. Bottle Gas/Propane		N/A	N/A	N/A	N/A	N/A	N/A
c. Electric		\$5.00	\$6.00	\$9.00	\$11.00	\$14.00	\$16.00
<b>Other Electric &amp; Cooling</b>							
Other Electric (Lights & Appliances)		\$19.00	\$22.00	\$31.00	\$39.00	\$48.00	\$57.00
Air Conditioning		\$8.00	\$9.00	\$13.00	\$16.00	\$20.00	\$23.00
<b>Water Heating</b>							
a. Natural Gas		\$7.00	\$8.00	\$11.00	\$14.00	\$19.00	\$22.00
b. Bottle Gas/Propane		N/A	N/A	N/A	N/A	N/A	N/A
c. Electric		\$12.00	\$14.00	\$17.00	\$21.00	\$25.00	\$29.00
d. Oil		N/A	N/A	N/A	N/A	N/A	N/A



## Public Housing Authority Utility Allowance Schedules, cont.

Housing providers can download their local PHA's schedules from the PHA's website, or can request a PHA representative send the schedule directly. The PHA schedules are simple to use, free of cost and applicable to almost any type of building. However, because PHA schedules are not specific to each property, the allowances do not always reflect residents' actual utility bills. The inaccuracy could mean that the UA is artificially high, in which case housing providers are not able to take advantage of savings from installing energy efficient equipment. If the UA is artificially low, this could mean the UA is not enough to cover most residents' utility expenditures. For PHAs whose schedules have not been updated in a long time, the allowance amounts reflect data from older, less energy efficient housing stock or building models. These allowances are often higher than residents' utility bills, discouraging housing providers from installing energy efficient and renewable technologies.

To address this issue, in 2011 HUD provided guidance on how PHAs can set energy efficient (EE) schedules in addition to standard UA schedules.<sup>12</sup> Providers are permitted to use EE schedules if they submit proof of energy efficient features in a property. For calculating the EE schedules, PHAs can use resident utility bill data from selected energy efficient housing stock if using the consumption-based methodology, or use an engineering model incorporating more energy efficient features. Since these schedules account for more energy-saving technologies, the resulting UA values are typically lower compared to the standard schedule values for the same end use and fuel type. For example, in the Sacramento Housing and Redevelopment Agency EE schedule, the allowance for electric heating in a one-bedroom apartment is \$9 compared to \$13 from the standard schedule. EE schedules can help to encourage the installation of energy efficient technologies by lowering the UA amount to reflect these upgrades.

Figure 4: Comparison of utility allowances for space heating between standard and energy efficient schedules from the Sacramento Housing and Redevelopment Agency<sup>13</sup>

Locality: <b>Sacramento Housing and Redevelopment Agency, CA</b>		Unit Type: <b>Apartment/Walk Up</b>				
Utility or Service:	<b>0 BR</b>	<b>1 BR</b>	<b>2 BR</b>	<b>3 BR</b>	<b>4 BR</b>	<b>5 BR</b>
	Monthly Dollar Allowances					
<b>Heating</b>						
a. Natural Gas (includes Climate Credit)	\$13.00	\$16.00	\$18.00	\$20.00	\$22.00	\$24.00
b. Bottle Gas/Propane	N/A	N/A	N/A	N/A	N/A	N/A
c. Electric	\$11.00	\$13.00	\$16.00	\$19.00	\$22.00	\$26.00
d. Oil	N/A	N/A	N/A	N/A	N/A	N/A

Locality: <b>Sacramento Housing and Redevelopment Agency, CA</b>		Unit Type: <b>Energy Efficient Multi-Family</b>				
Utility or Service:	0 BR	1 BR	2 BR	3 BR	4 BR	5 BR
	Monthly Dollar Allowances					
Heating						
a. Natural Gas <b>(Includes Climate Credit)</b>	\$10.00	\$12.00	\$14.00	\$16.00	\$18.00	\$19.00
b. Bottle Gas/Propane						
c. Electric	\$8.00	\$9.00	\$12.00	\$14.00	\$16.00	\$19.00
d. Electric Heat Pump	\$7.00	\$8.00	\$10.00	\$11.00	\$12.00	\$13.00

# Public Housing Authority Utility Allowance Schedules, cont.

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## Benefits and Challenges for Electrification

Standard schedules may at first seem to accommodate electrification since they provide options for both electric and gas equipment. However, housing providers should always pair electrification with energy efficiency to further reduce building energy consumption. In the case of space heating, replacing a gas furnace with an electric heat pump would save energy, but without improving the energy efficiency of a poorly insulated building through weatherization, even a heat pump would have high energy consumption due to air leakages.<sup>14</sup> Performing electrification and energy efficiency upgrades simultaneously is also more cost effective.<sup>15</sup> The energy efficient allowances can help housing providers finance both types of upgrades at the same time. Although HUD released guidance on EE schedules in 2011, many PHAs in California have yet to adopt these schedules.

Another way PHA schedules can encourage electrification and renewable energy is by accounting for these newer technologies as options in their schedules, whether standard or energy efficient. For example, electric heat pumps result in significantly lower electricity consumption compared to electric resistance heating,<sup>16</sup> but many PHAs only provide an allowance for electric resistance heating. Other technologies not accounted for in the typical PHA schedule include solar photovoltaic panels (solar PV), heat pump water heating and battery storage.

With climate change and the increasing frequency of heat waves, housing providers need to think not only about reducing building energy consumption, but also the increased need for air conditioning. Currently HUD only requires PHAs to provide allowances for air conditioning if the majority of housing units in the area provide it.<sup>17</sup> More places in California are starting to need air conditioning where it did not seem necessary before. PHAs should account for the increased cooling cost, otherwise the burden will fall on low-income renters.

*See next for policy recommendations.*

# Public Housing Authority Utility Allowance Schedules, cont.

## Policy Recommendations

In order to encourage electrification and ensure that low-income renters don't bear the cost of increased cooling, the Partnership proposes the following recommendations for HUD to update PHA guidance:

1. Require public housing authorities (PHAs) to provide energy efficient (EE) schedules to make it easier for housing providers to be credited for energy efficient equipment installation.
2. Require PHAs to provide allowances for the following energy efficient and renewable technologies to help incentivize their adoption: heat pumps for both space heating and water heating, induction cooktops, solar PV on rooftops or through community solar, and battery storage.
3. Require all PHAs to provide allowances for air conditioning.
4. Require PHAs to report their calculation methodology to HUD and make it accessible for the public to increase transparency and accountability in the UA process.

### **1) Require public housing authorities (PHAs) to provide energy efficient (EE) schedules to make it easier for housing providers to be credited for energy efficient equipment installation.**

Few public housing authorities in California have adopted EE schedules, although the option has existed since 2011. Most PHAs have websites, and some publish their utility allowance schedules online. Out of 113 PHAs in California,<sup>18</sup> 61 schedules were found online. Only one in five of the 61 PHAs provided EE schedules. Appendix 2 contains more information about the types of schedules and technologies included in the PHA schedules found online.

To calculate EE schedules, PHAs that use actual utility bill data would simply need to remove datapoints from less energy efficient housing stock, while PHAs that use an engineering model would add energy efficient features such as heat pumps, LED lighting, and ENERGY STAR® appliances. Since only 20% of California PHAs have adopted these schedules in the past ten years, HUD should require PHAs to issue these schedules. HUD could add this requirement to the next update of HUD guidelines for PHAs.

### **2) Require PHAs to provide allowances for the following energy efficient and renewable technologies to help incentivize their adoption: heat pumps for both space heating and water heating, induction cooktops, solar PV on rooftops or through community solar, and battery storage.**

Currently, less than half of the 61 schedules found online provide an allowance for electric heat pumps. None of the schedules account for solar PV, heat pump water heating and induction cooking. Housing providers are considering residents' health and safety and responding to climate change by adopting these newer technologies, often in new construction but also in existing buildings. Housing providers must also use these technologies to meet all-electric and electric-ready reach code requirements, which have been adopted in over 53 jurisdictions in California.<sup>19,20</sup>

The cost barrier to electrification is hard to overcome without accounting for these technologies in the UA process. PHAs that want to include allowances for heat pump space heating can look to other PHAs that already provide this allowance, such as housing authorities in Pasadena, Fresno and Marin County. Appendix 3 contains a complete list of PHAs providing heat pump allowances, along with the allowance amounts. Since no PHA schedules found online include allowances for induction cooking and heat pump water heating, PHAs can follow the guidance in the "Utility Allowances" chapter of the Housing Choice Voucher Program Guidebook.<sup>21</sup> They could account for solar PV and battery storage through a negative allowance, where the final UA amount is reduced based on the energy provided to the resident through solar PV or storage.

# Public Housing Authority Utility Allowance Schedules, cont.

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PHAs should provide options for both rooftop and community solar. HUD should require PHAs to include these technologies in their schedules to ensure the schedules reflect electrification upgrades across California.

## **3) Require all PHAs to provide allowances for air conditioning.**

Air conditioning is currently included as an allowance on approximately 60% of the schedules found online. One way to determine whether air conditioning is needed in a particular location is cooling degree days (CDD). This metric gives the number of degrees above which a daily average temperature exceeds a reference temperature, summed over the year.<sup>22</sup> It is an indicator of how much cooling is needed in a particular region. CDD values averaged over the past 30 years, using a reference temperature of 65°F, for the PHA locations in California range from 17 to 4133. Most schedules in places with very high CDD values include air conditioning. For PHAs with CDD values over 1300, 14 of 16 schedules have air conditioning allowances. This proportion drops to around a third of the 17 schedules for CDD values less than 500. Between 500-1300 CDDs, the inclusion of the air conditioning allowance is inconsistent and does not appear to follow a pattern based on CDD. Even PHAs with relatively low CDD values account for air conditioning. For example, the average CDD over the past 30 years is 17 for Humboldt County, but the Housing Authority of the County of Humboldt still provides an air conditioning allowance. Refer to Appendix 4 for the complete dataset showing CDD averages and air conditioning allowance inclusion for PHAs with online schedules.

Some participants noted that air conditioning needs to be installed across California, not just in regions that have historically needed air conditioning, to equitably address the increase in heatwave temperatures and frequency. All regions the PHAs are located in exhibit a projected increase in average CDD over the next 30 years, with some increases as high as 200% compared to the average of the previous 30 years. The existing HUD guidelines recommend that PHAs should only account for air conditioning in regions where a majority of housing units have air conditioning.<sup>23</sup> HUD should update the guidelines and require air conditioning allowances for all PHAs in response to the significant increase in cooling needs across various states, including California.

## **4) Require PHAs to report their calculation methodology to HUD and make it accessible for the public to increase transparency and accountability in the UA process.**

While HUD sets guidelines and rules for how PHAs should calculate UA schedules, they do not maintain a database of PHA schedules or provide data comparisons of the schedules that are accessible to the public. Sometimes, there is a significant difference between actual utility bills compared to the UA estimate provided on the PHA schedule. When the UA estimate is too low, residents need to pay a higher share of their income on electricity bills. Residents and housing providers often don't have a way of disputing PHA utility allowance calculations that are too low because most PHAs do not publish their calculation methodology online. It is also unclear how and when HUD internally reviews and evaluates PHA schedules.<sup>24</sup>

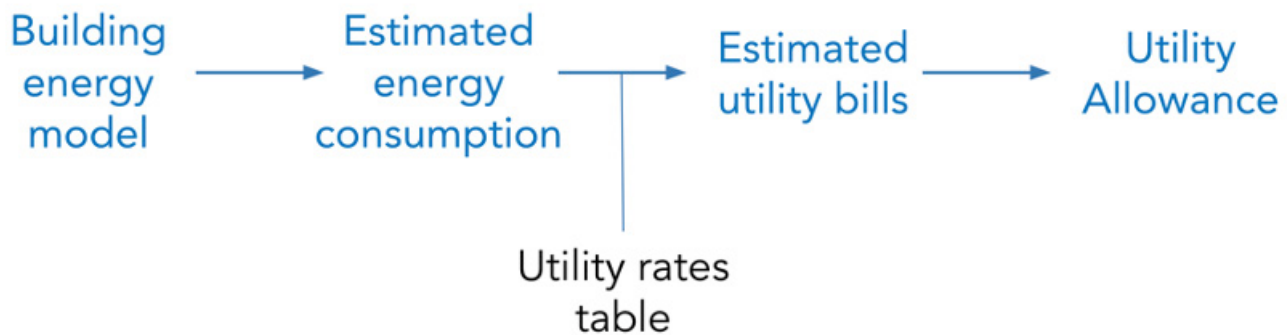
Many PHAs already upload their UA schedules to their website. The UA schedule document on the El Dorado County Public Housing Authority website, for example, contains not only the UA schedule but also shows the steps in their UA calculation process.<sup>25</sup> The UA calculation process could be more transparent if other PHAs similarly make their methodology available to the public. This would make it easier for housing providers and affordable housing residents to hold PHAs accountable when UAs are outdated, too high or too low.

# THE CALIFORNIA UTILITY ALLOWANCE CALCULATOR

## How It Works

The California Utility Allowance Calculator (CUAC) is a project-specific UA calculation method. The following diagram shows the process of obtaining a UA through the CUAC.

*Figure 5: Steps in the California Utility Allowance Calculator process to obtaining a utility allowance estimate*



This process is conducted by a third party consultant. The consultant begins by creating an engineering model of the building, including design features such as the heating, ventilation and air conditioning (HVAC) equipment and lighting that is specific to the project. This model is used to estimate the energy consumption for each unit type, distinguished by the number of bedrooms. The consultant then uses a table of utility rates to obtain residents' estimated utility bills from the estimated energy consumption. Since the CUAC accounts for design features specific to each development, the resulting utility allowance is often more accurate to residents' actual utility bills. New construction and updates to existing buildings tend to incorporate newer, more efficient technologies that consume less energy. As a result, the CUAC usually provides lower UAs compared to the PHA schedule allowances.

Unlike the PHA schedules, however, not every development is eligible to use the CUAC. Currently, TCAC limits the use of the CUAC to new construction projects and rehabilitation projects that meet certain energy efficiency or solar PV requirements. New construction projects are eligible if they are built to the Title 24 Building Energy Efficiency Standards (Title 24) in effect at the time of construction. To use the CUAC, rehabilitation projects applying for tax credits in 2018 or later must either improve efficiency by at least 20%, or install solar PV that would offset 50% of residential loads. Existing tax credit projects are eligible only if they install new solar PV through the MASH program or another solar program administered by a municipal utility or joint powers authority, and if the PV installed will offset residential loads<sup>26</sup>.

In addition to eligibility restrictions, cost can also present a barrier to CUAC adoption. Housing providers need to hire a certified consultant to conduct the analysis, including the building energy model used to estimate energy consumption. TCAC also requires providers to send the analysis back to them for quality control review, to ensure that no errors were made in the UA calculation process. The cost of the quality control review ranges from \$500-\$2,500, depending on how many times TCAC must send the analysis back for corrections.<sup>27</sup> The analysis must be updated every year according to TCAC regulations, which can also incur a cost. Usually annual updates only involve changing the utility rates table to reflect the latest rates, but they can also involve changing the energy consumption model if equipment has been replaced or added. The annual update also comes with potential costs, as some consultants charge for the updates while others do not. Costs to update can vary depending on whether changes are made only to the utility rates table or also to the energy consumption model.

# The California Utility Allowance Calculator, cont.

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After the CUAC analysis by the consultant is complete, housing providers send the documentation to TCAC for approval before using the resulting UA. For properties adding solar PV, housing providers also need to obtain a Permission to Operate (PTO) and Virtual Net Energy Metering (VNEM) agreement prior to submitting documentation to TCAC. Obtaining this documentation can take several weeks to months, while approval by TCAC takes around two to three weeks. The process overall is longer and more costly than using the PHA schedule. However, the process also has more accountability due to the quality control review and a final check that verifies whether providers implemented the energy efficient features proposed in the design.

Using the CUAC tends to result in more accurate and lower UAs. Choosing between the CUAC and PHA schedule is often a difficult decision, as there are many factors to consider beyond electrification benefits such as ease of use, cost, accuracy and accountability.

## Benefits & Challenges for Electrification

The main benefit the CUAC provides for electrification is its accuracy, which usually results in lower UAs and therefore more savings for housing providers trying to electrify. The CUAC allows the use of the EnergyPro building energy modelling software. This modeling software can account for technologies such as heat pumps for space and water heating, and solar PV. The CUAC also accounts for air conditioning. While the CUAC process allows providers to account for a wider range of technologies than the typical PHA schedule, it is also missing some technologies that more providers will start using in the next few years in response to Title 24 and reach code updates, such as induction cooking and battery storage.

In addition to the wide variety of technologies, the CUAC also maintains accuracy through the annual update process. If housing providers have added significant upgrades since the previous year, they need to update the building energy model. Otherwise, the annual update only involves changing the utility rates in the table used to convert modelled energy consumption into estimated utility bills. The utility rates table at the moment does not include Time of Use (TOU) rates. Since this rate is already in effect and would change residents' utility bills, it would affect the accuracy of the UA estimate.

While the CUAC can help providers electrify by providing more accurate UAs, many providers are still unable to use the CUAC. Part of the reason is that non-tax credit rehabilitation projects are ineligible, and projects with HUD rental assistance need written consent from HUD.<sup>28</sup> Apart from eligibility requirements, cost is also a major barrier to more widespread adoption of the CUAC. Housing providers can save costs by hiring the same consultant to perform the Title 24 and CUAC calculations. Like the CUAC, meeting Title 24 standards requires creating an engineering model with property-specific features to calculate building energy consumption. The CUAC modeling process would just require the additional steps of calculating energy consumption for each unit type and estimating utility bills. Hiring the same consultant for both Title 24 and the CUAC building energy modelling can help with the expense of the CUAC, but cost still presents a significant barrier to adoption.

## When to Use the California Utility Allowance Calculator

If they are able to meet the eligibility requirements and overcome the cost barriers, the lower UAs obtained through the CUAC can help affordable housing providers electrify. However, the CUAC does not always result in lower UAs compared to the PHA schedule. The CUAC is less cost effective when the CUAC allowance is higher than the PHA allowance for a particular property.

There are several factors that can contribute to a higher CUAC allowance:

- For new construction developments installing solar photovoltaics (PV) and exceeding energy efficiency standards or electric equipment requirements, it is often beneficial to use the CUAC over the PHA schedule. When new developments are only installing solar PV without exceeding energy efficiency or



## The California Utility Allowance Calculator, cont.

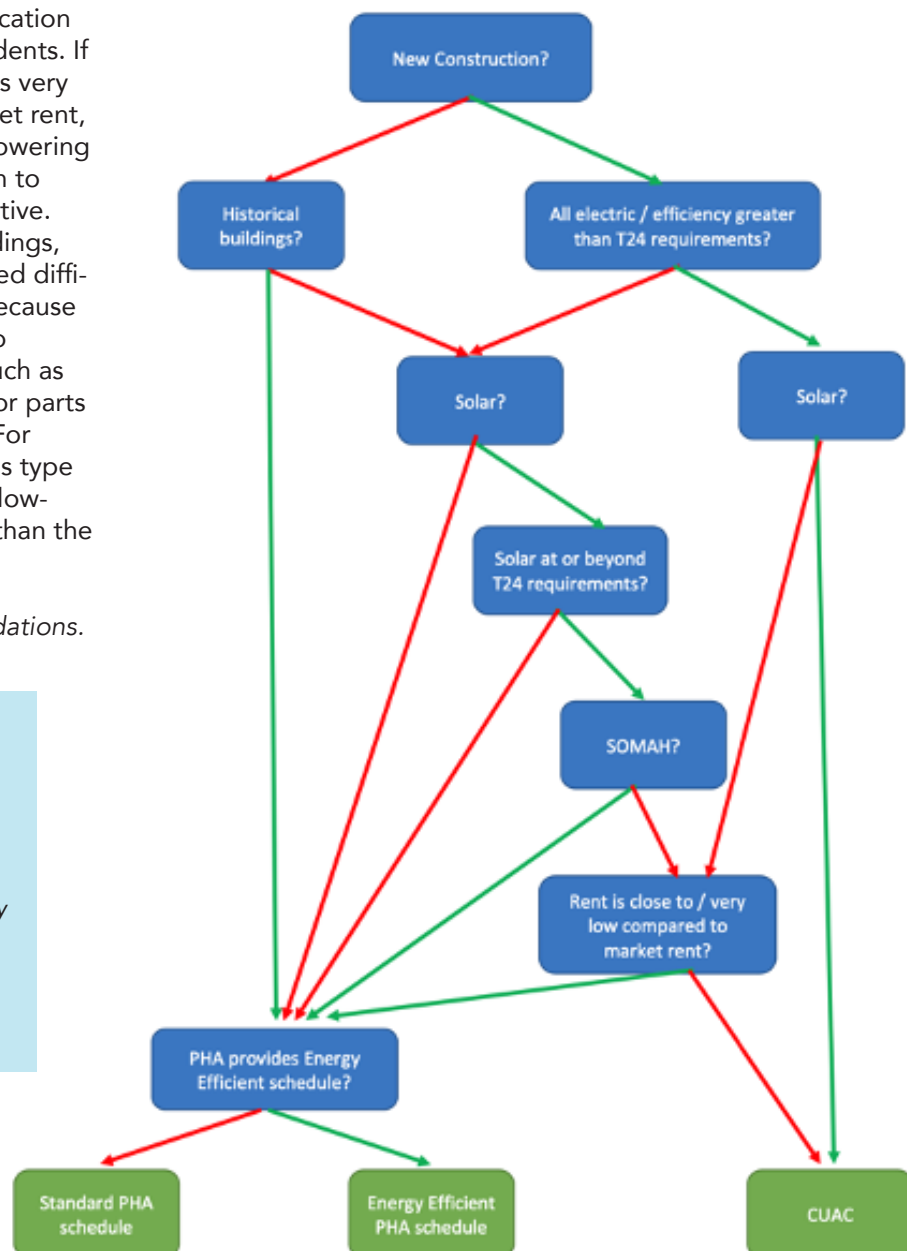
electric requirements, or when existing buildings are installing solar PV in addition to energy efficiency improvements, then providers should carefully consider the following conditions when choosing between the UA methods. Since the CUAC only accounts for solar PV at or beyond Title 24 requirements, the CUAC would not be as cost effective for projects installing solar PV less than the Title 24 requirements. For projects using the Solar on Multifamily Affordable Housing (SOMAH) incentive program, providers cannot use UAs to obtain the benefits from residential solar installation as the savings must go towards residents.<sup>29</sup> With SOMAH, it would also not be as cost effective to use the CUAC.

- Another important consideration is how close the amount residents pay (net rent) is to the market rent. If the net rent is already very close to market rent, then lowering UAs to allow providers more savings from electrification could adversely affect residents. If the amount residents pay is very low compared to the market rent, then the savings through lowering the UA may not be enough to make the CUAC cost-effective.
- For existing historical buildings, some providers encountered difficulties when electrifying because they were not permitted to replace certain features, such as the space heating system or parts of the building envelope. For historical buildings with this type of restriction, the CUAC allowance is likely to be higher than the PHA schedule allowance.

See next for policy recommendations.

This flowchart helps to illustrate when it is more advantageous to use the CUAC or PHA schedule, based on the experiences of housing providers and CUAC consultants. While it highlights factors that housing providers may want to consider before deciding on a UA method, it is not meant to take precedence over UA rules from TCAC and HUD.

Figure 6: Flowchart indicating when to use the CUAC or PHA schedule based on property-specific factors



# The California Utility Allowance Calculator, cont.

## Policy Recommendations

To allow more housing providers to benefit from using the California Utility Allowance Calculator (CUAC), the Partnership recommends the following policy updates for the Tax Credit Allocation Committee (TCAC), the U.S. Department of Housing and Urban Development (HUD) and the California Energy Commission (CEC) to consider:

1. Expand the use of the CUAC to existing deed-restricted properties that are undertaking rehabilitation upgrades not financed using new tax credits but still meeting minimum energy efficiency improvements.
2. Allow properties that receive HUD rental assistance to use the CUAC without requiring written consent from HUD.
3. The CEC should ensure that the CUAC provides an allowance for induction cooking and accounts for battery storage.
4. The CEC should update the CUAC to provide the option for using time of use (TOU) rates in the calculation process.
5. HUD and TCAC should establish consistency of included technologies between PHA schedules and the CUAC.

### **1) Expand the use of the CUAC to existing deed-restricted properties that are undertaking rehabilitation upgrades not financed using new tax credits but still meeting minimum energy efficiency improvements.**

Currently the CUAC requirements only include rehabilitation projects applying for tax credits in 2018 or later that meet certain efficiency or solar PV generation requirements. Housing providers who are not using tax credit funding may also want to use the CUAC due to its accuracy and ability to capture electrification benefits when incorporating decarbonization measures into their rehabilitation projects.

Given the State has mandated a policy that – with the exception of preservation projects – all tax credits must be allocated to new construction, rehabilitation financing will be coming from different sources than federal tax credits. The California Tax Credit Allocation Committee should update the language in its regulations for UAs<sup>30</sup> to allow non-tax credit financed rehabilitation projects in the TCAC portfolio to use the CUAC when pursuing projects that improve efficiency by at least 50% and/or are installing solar PV that would offset at least 50% of residential loads.

### **2) Allow properties that receive HUD rental assistance to use the CUAC without requiring written consent from HUD.**

For projects using HUD rental assistance, HUD requires that housing providers obtain written consent from the HUD representative for that jurisdiction in order to utilize the CUAC. This additional step to the already long process of obtaining the CUAC allowance is another barrier to adoption. It is sometimes unclear to housing providers who the correct contact at HUD is, from whom they must obtain this consent. Housing providers can also be hesitant to use the CUAC for a development with HUD rental assistance because they are unsure whether HUD will actually provide the written consent or how long it will take. Removing the need for written consent will help address this barrier to CUAC adoption.



## The California Utility Allowance Calculator, cont.

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### **3) The CEC should ensure that the CUAC provides an allowance for induction cooking and accounts for battery storage.**

The CUAC already accounts for many technologies compared to the standard PHA schedule. It should also account for induction cooking and battery storage to maintain its accuracy and to help incentivize these technologies. Summit participants noted that battery storage in particular is prohibitively expensive at the moment. Incorporating a way for providers to get credit for battery storage systems in the same way the CUAC accounts for solar PV will help reduce the financial burden and increase the adoption of storage systems, which are also beneficial for resiliency.

### **4) The CEC should update the CUAC to provide the option for using time of use (TOU) rates in the calculation process.**

Many utility providers in California have already begun transitioning customers to time of use rates in an effort to discourage electricity consumption during peak demand times, which will help to reduce peak stress on the grid. The CEC should update the utility rates table to include TOU rates in order to maintain accuracy of the calculator. Summit participants suggested that the impact of TOU rates should be prioritized as customers are already using these rates, but the CEC should also continually update the CUAC according to the latest developments in utility rates, electrification incentive programs and Title 24.

### **5) HUD and TCAC should establish consistency of included technologies between PHA schedules and the CUAC.**

If the CUAC and PHA schedules don't include the same technologies within a region, using one of the methods could result in artificially high UAs compared to the other. For example, in a region that historically has not needed air conditioning due to its cooler climate, if the CUAC accounts for air conditioning while the local PHA schedule does not, then the CUAC UA is unnecessarily higher. This could deter people from choosing the CUAC, since it does have a longer process and higher cost. Within the same region, the CUAC and PHA schedules should include the same technologies to avoid this issue and to make choosing between the two options easier for housing providers.

# CONCLUSION

The State of California needs to take every step to ensure that the dual goals of climate change mitigation and affordable housing construction and preservation are met. Building electrification can help bridge some of the gaps in housing and climate policies. However, to prioritize equity in both housing and climate policies, policymakers and advocates need to ensure that split incentives, a significant challenge in pursuing building upgrades, are addressed. Utility allowances can help rent-restricted multifamily affordable housing providers invest in electrification and make critical upgrades while ensuring that residents are still able to reap the financial and health benefits of electrification. State and local agencies need to update utility allowance guidelines to facilitate electrification and incorporate newer cost and climate effective technologies.

# ENDNOTES

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## Endnotes, cont.

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## APPENDIX 1

### Example Utility Allowance Calculation from Public Housing Authority Utility Allowance Schedule

This example from the Sacramento Housing Redevelopment Agency shows both the standard schedule and the energy efficient schedule. The difference between the standard and energy efficient schedules leads to a \$12 reduction in the utility allowance for the household. To the right are the characteristics of the household in this example.

Number of bedrooms	2
Heating fuel type	Electric
Cooking Fuel Type	Electric
Other electric	Lights and appliances Air conditioning
Water heating fuel type	Natural gas

#### Standard Utility Allowance Calculation

In this example, the total standard utility allowance is calculated to be \$80.

Locality: <b>Sacramento Housing and Redevelopment Agency, CA</b>		Unit Type: <b>Apartment/Walk Up</b>				
Utility or Service:	<b>0 BR</b>	<b>1 BR</b>	<b>2 BR</b>	<b>3 BR</b>	<b>4 BR</b>	<b>5 BR</b>
Monthly Dollar Allowances						
<b>Heating</b>						
a. Natural Gas (includes Climate Credit)	\$13.00	\$16.00	\$18.00	\$20.00	\$22.00	\$24.00
b. Bottle Gas/Propane	N/A	N/A	N/A	N/A	N/A	N/A
c. Electric	\$11.00	\$13.00	\$16.00	\$19.00	\$22.00	\$26.00
d. Oil	N/A	N/A	N/A	N/A	N/A	N/A
<b>Cooking</b>						
a. Natural Gas	\$3.00	\$3.00	\$6.00	\$7.00	\$9.00	\$10.00
b. Bottle Gas/Propane	N/A	N/A	N/A	N/A	N/A	N/A
c. Electric	\$5.00	\$6.00	\$9.00	\$11.00	\$14.00	\$16.00
<b>Other Electric &amp; Cooling</b>						
Other Electric (Lights & Appliances)	\$19.00	\$22.00	\$31.00	\$39.00	\$48.00	\$57.00
Air Conditioning	\$8.00	\$9.00	\$13.00	\$16.00	\$20.00	\$23.00
<b>Water Heating</b>						
a. Natural Gas	\$7.00	\$8.00	\$11.00	\$14.00	\$19.00	\$22.00
b. Bottle Gas/Propane	N/A	N/A	N/A	N/A	N/A	N/A
c. Electric	\$12.00	\$14.00	\$17.00	\$21.00	\$25.00	\$29.00
d. Oil	N/A	N/A	N/A	N/A	N/A	N/A

#### Energy Efficient Utility Allowance

For the same household in this example, the total energy efficient utility allowance would be \$68.

Using the energy efficient schedule, providers can recover more savings from energy efficient installations.

Locality: <b>Sacramento Housing and Redevelopment Agency, CA</b>		Unit Type: <b>Energy Efficient Multi-Family</b>					
Utility or Service:	0 BR	1 BR	2 BR	3 BR	4 BR	5 BR	
	Monthly Dollar Allowances						
<b>Heating</b>							
a. Natural Gas <b>(Includes Climate Credit)</b>	\$10.00	\$12.00	\$14.00	\$16.00	\$18.00	\$19.00	
b. Bottle Gas/Propane							
c. Electric	\$8.00	\$9.00	\$12.00	\$14.00	\$16.00	\$19.00	
d. Electric Heat Pump	\$7.00	\$8.00	\$10.00	\$11.00	\$12.00	\$13.00	
<b>Cooking</b>							
a. Natural Gas	\$2.00	\$3.00	\$4.00	\$6.00	\$7.00	\$9.00	
b. Bottle Gas/Propane							
c. Electric	\$4.00	\$5.00	\$7.00	\$10.00	\$12.00	\$14.00	
<b>Other Electric &amp; Cooling</b>							
Other Electric (Lights & Appliances)	\$16.00	\$19.00	\$27.00	\$34.00	\$42.00	\$49.00	
Air Conditioning	\$8.00	\$10.00	\$13.00	\$17.00	\$21.00	\$25.00	
<b>Water Heating</b>							
a. Natural Gas	\$6.00	\$7.00	\$9.00	\$12.00	\$16.00	\$18.00	
b. Bottle Gas/Propane							
c. Electric	\$10.00	\$12.00	\$15.00	\$18.00	\$22.00	\$25.00	

## APPENDIX 2

### Public Housing Authority Schedules

The following table summarizes data for certain technologies and schedule types included in the 61 public housing authority (PHA) schedules online:

Schedule Type / Technology Included	Number of PHAs	Percentage of PHAs with Schedules
Energy efficient schedule	12	20%
All-electric schedule	4	7%
Electric heat pump allowance included	23	38%
Air conditioning allowance included	36	59%

The complete data set, including names of the PHAs and links to the UA schedules, can be found on pages 1-2 of this data matrix: <https://chpc.net/resources/pha-schedule-data-2022/>

*Please note: Some PHAs serve multiple areas and have a separate schedule for each area.*

For a complete list of PHAs in California, see: Affordable Housing Online. California Public Housing Agencies. Retrieved from: <https://affordablehousingonline.com/housing-authorities/California>

## APPENDIX 3

### Public Housing Authority Heat Pump Allowances

The following is a list of public housing authorities (PHAs) that already provide heat pump allowances for space heating on their schedules. Contact information can usually be found on each PHA's website.

Name of PHA	Website Link
Housing Authority of the City of San Buenaventura	<a href="https://www.hacityventura.org/">https://www.hacityventura.org/</a>
Housing Authority of the City of Calexico	<a href="https://www.calexicohousing.org/">https://www.calexicohousing.org/</a>
Housing Authority of the City of Long Beach	<a href="https://www.longbeach.gov/haclb/">https://www.longbeach.gov/haclb/</a>
Housing Authority of the City of Pasadena	<a href="https://www.cityofpasadena.net/housing/">https://www.cityofpasadena.net/housing/</a>
Imperial Valley Housing Authority	<a href="https://www.ivha.org/">https://www.ivha.org/</a>
San Francisco Housing Authority	<a href="https://sfha.org/Pages/home.aspx">https://sfha.org/Pages/home.aspx</a>
Fresno Housing Authority	<a href="https://fresnohousing.org/">https://fresnohousing.org/</a>
Housing Authority of the County of Contra Costa	<a href="http://www.contracostahousing.org/">http://www.contracostahousing.org/</a>
Housing Authority of the County of Merced	<a href="http://www.merced-pha.com/">http://www.merced-pha.com/</a>
Housing Authority of Tulare County	<a href="https://www.hatc.net/">https://www.hatc.net/</a>
Housing Authority of the County of Monterey	<a href="https://hamonterey.org/">https://hamonterey.org/</a>
Housing Authority of the County of Marin	<a href="https://www.marinhousing.org/">https://www.marinhousing.org/</a>
City of Vallejo Housing Authority	<a href="https://www.cityofvallejo.net/city_hall/city_government/vallejo_housing_authority">https://www.cityofvallejo.net/city_hall/city_government/vallejo_housing_authority</a>
City of Berkeley Housing Authority	<a href="https://www.cityofberkeley.info/bha/">https://www.cityofberkeley.info/bha/</a>
Fairfield Housing Authority	<a href="https://www.fairfield.ca.gov/gov/depts/cd/authority.asp">https://www.fairfield.ca.gov/gov/depts/cd/authority.asp</a>
Housing Authority of the City of Livermore	<a href="https://livermoreha.org/index.html">https://livermoreha.org/index.html</a>
Housing Authority of the County of Humboldt	<a href="https://eurekahumboldtha.org/">https://eurekahumboldtha.org/</a>
City of Santa Rosa Housing Authority	<a href="https://srcity.org/599/Housing-Choice-Voucher-Section-8">https://srcity.org/599/Housing-Choice-Voucher-Section-8</a>
Vacaville Housing Authority	<a href="https://www.ci.vacaville.ca.us/departments/housing/housing-authorities-section-8/vacaville-housing-authority">https://www.ci.vacaville.ca.us/departments/housing/housing-authorities-section-8/vacaville-housing-authority</a>
Housing Authority of the County of San Joaquin	<a href="https://www.hacsjonline.org/">https://www.hacsjonline.org/</a>
Housing Authority of the County of Butte	<a href="http://www.butte-housing.com/">http://www.butte-housing.com/</a>
Yolo County Housing	<a href="http://www.ych.ca.gov/">http://www.ych.ca.gov/</a>
Placer County Housing Authority	<a href="https://www.placer.ca.gov/2134/Housing-Vouchers">https://www.placer.ca.gov/2134/Housing-Vouchers</a>

Heat pump allowance values from standard and energy efficient schedules issued by these PHAs can be found on page 3 of this data matrix: <https://chpc.net/resources/pha-schedule-data-2022/>

*Please note: These allowances are from 2021 schedules, and PHAs usually update their schedules every year.*

## APPENDIX 4

# Cooling Degree Day Data and Public Housing Authority Air Conditioning Allowances

A dataset for cooling degree days and air condition allowance inclusion for each of the public housing authorities (PHAs) that provide schedules online can be found on pages 4-5 of this data matrix:

<https://chpc.net/resources/pha-schedule-data-2022/>



