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STAFF REPORT

California Utility Allowance Calculator (CUAC)

User Guide

**Gavin Newsom, Governor
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California Energy Commission

Dee Anne Ross
Primary Author

Eugene Lee
Project Manager

Jennifer Nelson
Office Manager
EXISTING BUILDINGS OFFICE

Michael J. Sokol
Deputy Director
EFFICIENCY DIVISION

Drew Bohan
Executive Director

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ABSTRACT

The California Utility Allowance Calculator provides an estimate of what tenants will pay for energy utilities. California Utility Allowance Calculator accounts for the energy features of the proposed building, the photovoltaic system designed for it, and the applicable utility rates or tariffs.

The California Tax Credit Allocation Committee in the State Treasurer's Office allocates federal and state low-income housing tax credits in support of affordable housing. Applicants for tax credits and most other affordable housing programs must estimate utility costs for tenants in applications for grants, tax credits, or allocations. In 2008, the California Energy Commission worked with the affordable housing community and Tax Credit Allocation Committee to create a more accurate tool for estimating tenants' utility costs, resulting in the California Utility Allowance Calculator. The results are used in place of local public housing authorities' utility allowance schedules. This User Guide is to assist applicants using the tool in estimating utility costs.

Keywords: utility allowance, CUAC, California utility allowance calculator, affordable multifamily housing, energy consumption model

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1 Overview

1.1 Introduction

The California Utility Allowance Calculator (CUAC) allows affordable housing developers and energy consultants to provide an accurate estimate of what tenants will pay for energy utilities, accounting for the energy features of the proposed building, the applicable tariff/utility rate, and the photovoltaic (PV) system (if applicable). The CUAC can be used in new construction projects, rehabilitation of existing building projects, and reconstruction of existing buildings that involves tearing down the envelope of a building to the bare framing, rafters, and foundation and then rebuilding.

The Tax Credit Allocation Committee (TCAC) and California Debt Allocation Committee (CDLAC) allocate federal and state low-income housing tax credits in support of affordable housing, most commonly for multifamily buildings. Applicants for tax credits and most other affordable housing programs must estimate utility costs for tenants in applications for grants, tax credits, or allocations. TCAC requires a completed multifamily project to match what is proposed in the budget to ensure projects' utility expenses are accurately modeled using approved California Energy Commission (CEC) software. TCAC includes verification requirements for [new construction projects](https://www.treasurer.ca.gov/ctcac/cuac/new-construction.asp) on its website <https://www.treasurer.ca.gov/ctcac/cuac/new-construction.asp>. When a rehabilitation project is proposed, find TCAC's [rehabilitation submission](https://www.treasurer.ca.gov/ctcac/cuac/rehabilitation.asp) requirements and recommendations on its website <https://www.treasurer.ca.gov/ctcac/cuac/rehabilitation.asp>.

1.2 Background

TCAC, within the State Treasurer's Office, allocates federal and state low-income housing tax credits (LIHTCs) in support of affordable housing. Applicants for LIHTCs and most other affordable housing programs must estimate the utility costs for tenants. The most common source of utility cost estimates are local public housing authorities' utility allowance schedules, which generally overestimate utility costs by averaging historical costs and not including savings from energy efficiency and photovoltaics. In 2008, the CEC worked with the affordable housing community and TCAC to create a more accurate tool for estimating tenants' utility costs, resulting in the CUAC.

Other housing agencies may allow or require use of the CUAC. Check program requirements as to whether CUAC is an acceptable method for estimating utility allowances. Programs such as Multifamily Affordable Solar Housing (MASH) or Solar on Multifamily Affordable Housing (SOMAH) allow CUAC. Multifamily developments funded by the federal HOME Investment Partnerships (HOME) Program prohibits the use of public housing authority utility allowances, and therefore, an alternative utility allowance methodology, like the CUAC, must be used.

1.3 Signature Requirements

Pursuant to TCAC and CDLAC requirements, CUAC submittals must be signed by a [California Association of Building Energy Consultants](http://www.cabec.org) (www.cabec.org) Certified Energy Analyst (CABEC CEA) who is also either a certified Home Energy Rating System (HERS) Rater or a California licensed Mechanical Engineer or Electrical Engineer. For the latest guidance on these signature requirements, see Section 1.4.

1.4 Frequently Asked Questions

[Frequently asked questions](https://www.treasurer.ca.gov/ctcac/cuac/faq.pdf) for CUAC submittals are available from TCAC (https://www.treasurer.ca.gov/ctcac/cuac/faq.pdf). More information about program requirements for [TCAC](https://www.treasurer.ca.gov/ctcac/cuac/index.asp) and [CDLAC](https://www.treasurer.ca.gov/cdlac/) are on the State Treasurer's Office program website https://www.treasurer.ca.gov/ctcac/cuac/index.asp or www.treasurer.ca.gov/cdlac/.

1.5 CUAC Limitations

The CUAC represents tenant-paid utilities. If a project has hybrid heating or cooling systems and the energy paid by the building owner cannot be separated from the energy paid by the tenant (for example, 4-pipe fan coil system with a central boiler and chiller, and individual fan coils in each apartment), either (a) assume the tenant pays all costs (raising the estimated tenant-paid utility costs), or (b) not use the CUAC to estimate tenants' utility costs.

Check with TCAC or CDLAC for other alternatives to calculate tenant utility costs.

1.6 Title 24/Building Energy Efficiency Standards Reference Documents

Title 24, Part 6, building energy efficiency standards and compliance documents are available for download from the [CEC's 2019 building energy efficiency standards website](https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency) (https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency).

- 2019 Building Energy Efficiency Standards for Residential and Nonresidential Buildings
- 2019 Residential Compliance Manual
- 2019 Nonresidential Compliance Manual (applicable to multifamily buildings with four or more habitable stories)

In general, modeling details will be found in these compliance documents or in the software user manual. Section 3.4 includes suggestions for modeling which can affect the results of the CUAC.

1.7 Update Notification List

Notification of CUAC and utility rate updates are sent to CEC's CUAC list server. To sign up for these notifications, visit the CEC's [list server](#) page and follow the directions. CUAC is listed under Efficiency Lists (https://ww2.energy.ca.gov/listservers/index_cms.html).

1.8 Questions

CUAC Tool -- California Energy Commission
Dee Anne Ross, deeanne.ross@energy.ca.gov

TCAC and CDLAC program requirements or process
California State Treasurer's Office
www.treasurer.ca.gov/ctcac/cuac/index.asp
www.treasurer.ca.gov/cdlac/

2 Using CUAC

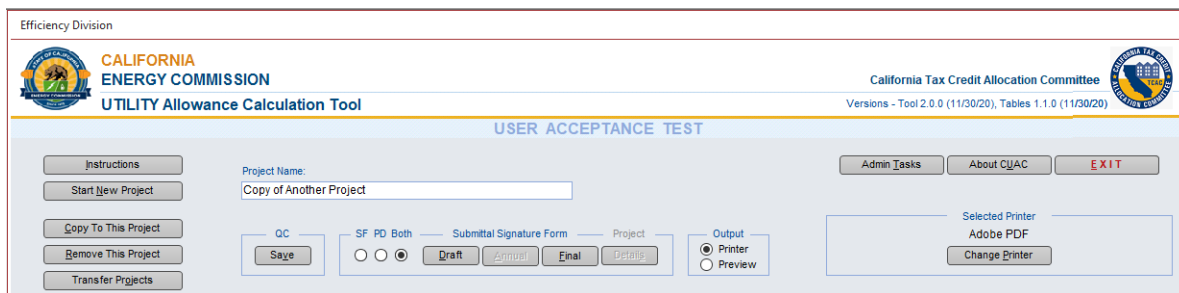
2.1 Installation

1. Download zip file (CUAC.zip) to desktop (or folder of choice). Unzip/extract all files (requires 40 kb).
2. Copy or cut/paste both files to the C:drive into a folder named CUAC. The destination must be C:\CUAC for the program to operate correctly (if it is in c:\CUAC\CUAC, move it one level up).
3. To start the program, locate c:\CUAC and double-click on the larger of the files (CUACTool-Rev2-0-0.accdb).

Older versions of CUAC must reside in the same folder to allow CUAC to find previous/older files and allow for the "Transfer Projects" function.

2.2 User Interface

Figure 2-1. User Interface



The appearance of the CUAC, its display screens, and how a user interacts with the program were updated in 2020 to make using the CUAC and working with files more intuitive. This section provides a guide to these features (Figure 2-1) and the project navigator (see Figure 2-3).

2.1.1 Instructions

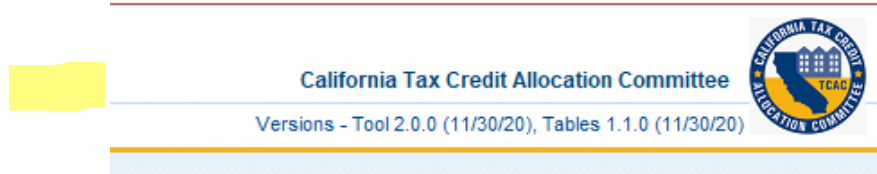
In addition to this user guide, there are instructions within the CUAC software.

2.1.2 Utility Rates

Utility rates are used by the CUAC to determine final utility allowances. The rates are based on the utility selected in the Utility Information tab (See Section 3.3.2).

As shown in Figure 2-2, the date the current utility rate tables were last updated is in the upper right, next to the CUAC version number.

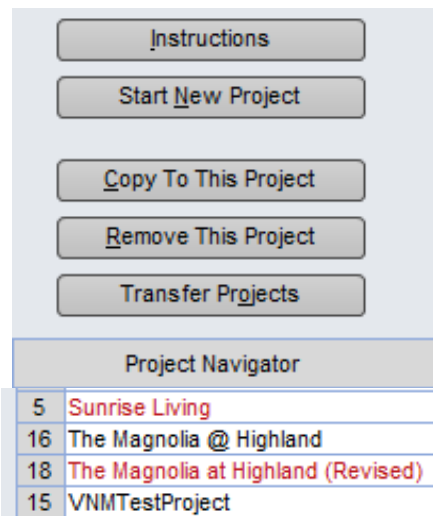
Figure 2-2. Table Update Date (Tariff Rates)



2.1.3 Project Navigator

Projects may be found by project name or ID (Figure 2-3). Red text means the project is final (Section 2.2.7). Click on the ID or name in the Project Navigator to access a project.

Figure 2-3. Project Navigator



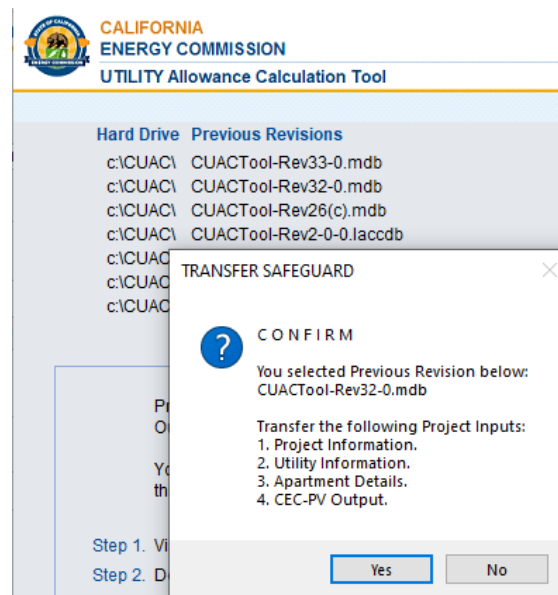
2.1.4 Transfer Projects

Previously entered projects in the CUAC folder can be transferred into the updated version. Projects exist in the "CUACTool-Rev" file (larger file), not the "LookupTables" file.

The first time using the feature requires some forethought and planning. The process transfers and replaces the current projects with all projects from the selected previous revision (meaning it does not keep project files from both revisions). Therefore, for projects that need to be retained, make a copy of the CUACTool-Rev*.acddb and place it in another folder to retrieve once the annual report for previous version(s) has been produced.

After selecting transfer projects, double click on which of the available previous revisions from which to transfer and respond "Yes" to the "CONFIRM" message two times.

Figure 2-4. Transfer Confirmation



2.1.5 Save and Print

CUAC provides save and print options as shown in Figure 2-5. Selecting quality control (QC)/save provides visual feedback, such as missing information or passes quality control in a banner (Figure 2-6) while saving inputs.

Figure 2-5. Save/Print Options

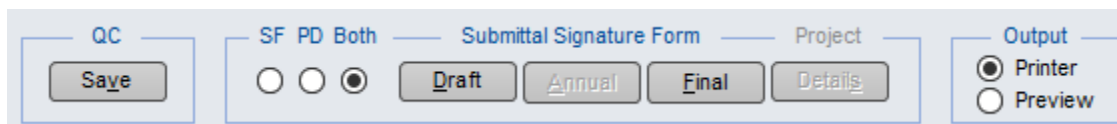
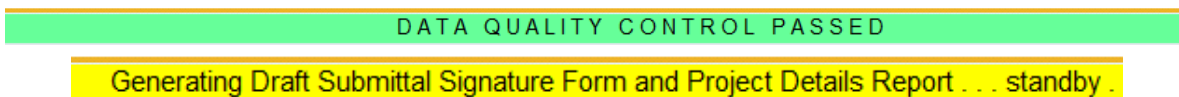


Figure 2-6. Figure Status Banner(s)



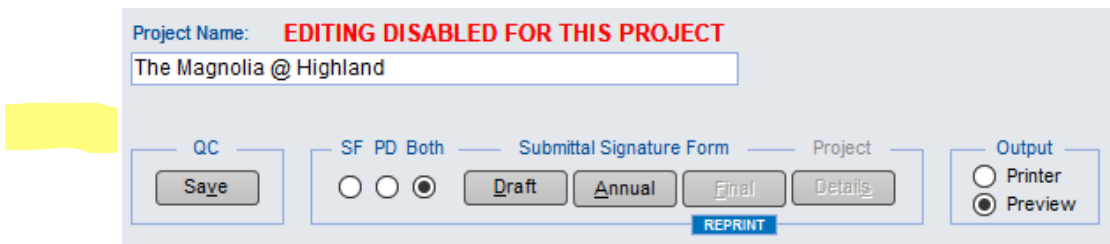
2.1.6 Forms

From the radio buttons (Figure 2-5), select which submittal signature form(s) to print or preview from the three options:

- SF = Submittal Form (includes signature page)
- PD = Print Detail report
- Both = Both documents

The draft or final options are equivalent to print once you have selected the printer (see Section 2.1.10), selected the forms, and specified output as either printer or preview. To produce the annual report select "Final" which locks program inputs from any further modification.

Figure 2-7. Final Project



2.1.8 Annual

To produce the annual report, select final. As required by TCAC/lending authority, once a project is deemed final, editing is disabled and no further modification of inputs is allowed (as shown in Figure 2-7). This action also unlocks the ability to produce an annual report.

The annual CUAC report uses the same inputs from year to year, updating only the utility allowances based on updated tariff tables.

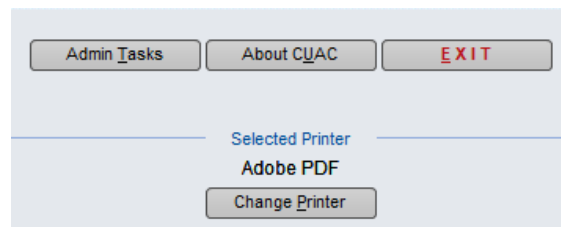
2.1.9 Output Printer/Preview

When selecting the output option of printer or preview, note that printing from a preview is not possible. To print after previewing the form, use the "X" in the upper right corner (or right-click and close), change the output to printer, and select draft or final.

2.1.10 Change Printer

To select or change printers (Figure 2-8), select from the options. If using Adobe PDF as printer, specify a project-specific name (the default name is the same for every report) and specify the location for each report separately.

Figure 2-8. Selected Printer



2.1.11 Delete Record

As shown in Figure 2-9, when an apartment type or an installed PV system is no longer needed for a project, left-click in the column to the left of the name, press the delete key, and confirm the deletion. This information is also included in Instructions, Record Deletion from inside CUAC.

Figure 2-9. Delete Record

The screenshot shows a software interface with a table titled "Input Apartments Inventory" and a "Delete Safeguard" dialog box. The table has three columns: "Apartment Type", "# Affordable Housing Units", and "# Market Housing Units". The rows are: Studio (0, 0), One Bedroom (8, 2), Two Bedroom (18, 2), Three Bedroom (9, 1), and an asterisk (*) (0, 0). The "Delete Safeguard" dialog box contains a question mark icon, the text "CONFIRM", "Delete Apartment Type 'Studio'?", "Do you want to continue?", and two buttons: "Yes" and "No".

Apartment Type	# Affordable Housing Units	# Market Housing Units
▶ Studio	0	0
One Bedroom	8	2
Two Bedroom	18	2
Three Bedroom	9	1
*	0	0

Delete Safeguard

CONFIRM

Delete Apartment Type 'Studio'?

Do you want to continue?

3 CUAC Inputs

3.1 Introduction

There are six steps to complete a CUAC estimate (these steps are different from the steps listed under "Instructions" inside CUAC):

Step 1: Start a new project

Step 2: Project information, utility information, and apartment details

Step 3: Energy use from an Alternative Calculation Method (ACM), which is a Title 24 energy compliance program such as California Building Energy Code Compliance (CBECC-Res, CBECC-Com), or EnergyPro

Step 4: Lighting and appliance information

Step 5: CEC-PV calculator output

Step 6: Verify summary and print results / **NOTE:** Once select "Final," inputs are locked from further edits

3.2 Step 1 - Start a New Project or Copy from an Existing Project

3.2.1 New Project

Click on "Start New Project" and insert a unique project name. The name may be changed at any point during the data entry phase.

3.2.2 Copy Existing Project

Start a new project, enter the new project name, and select "Copy to this Project" option. Select the name of the project that contains the data (source) to be copied. The note is a safeguard warning that if there is any data in this new project (other than the name) it will be replaced with the data from the source project. Click "Copy Project" to complete the transfer.

If the existing project is from an older version of CUAC, see Section 2.2 Transfer Projects.

3.3 Step 2 - Project Information, Utility Information, and Apartment Details

3.3.1 Project Information Tab

Figure 3-1. Site Information

As shown in Figure 3-1, enter the site address, owner name and address, contact name, email address, and phone number for the CUAC project data. The Assessor’s Parcel Number (APN) is not a required input. “Other Project Identifier” is also an optional field.

3.3.2 Utility Information Tab

Select the utility providers (e.g., Modesto Irrigation District, SoCalGas) and rate schedules for electricity and gas as shown in Figure 3-2 (Appendix A is a list of utilities and abbreviated names). If the utility provider is a community choice aggregator (CCA), select the utility providing the power to the CCA. Select the territory; large utilities have additional criteria that align with billing territories. Questions related to territories should be directed to the utility.

Figure 3-2. Utility Information

For buildings with liquefied petroleum gas or propane, select “Propane” for the gas utility. If fossil gas, renewable gas, synthetic gas nor propane is used in the building, select “No Gas” rather than leaving the field blank. The propane rate in the CUAC is a statewide average typically adjusted on an annual basis.

3.3.2.1 Tariff Type / CARE

Tariff types include standard and California Alternate Rates for Energy (CARE) programs. CARE is intended to identify any low-income utility tariff program although the name of the program may vary. CARE rates only apply if ALL tenant households qualify for the special low-income utility rates.

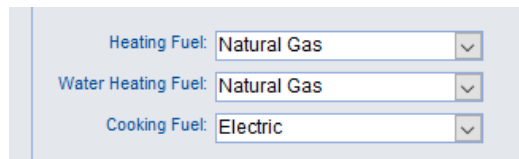
To use the CARE tariff:

- Compare the highest household income that would qualify for an apartment in the project against the income qualifications of the CARE program. This is done for each household size (number of persons). The maximum and minimum household size assumptions for a project must match those used in setting the LIHTC rent and income limits, which are 1.5 persons per bedroom, unrounded, and 1 person for studio units.
- Utility low-income tariff programs are voluntary, and the analyst preparing the CUAC inputs should confirm that the project will have a tenant program in place to encourage participation in the CARE program.

3.3.2.2 Appliance Fuel Types

As shown in Figure 3-3, specify heating, water heating, and cooking fuel as electric, natural gas, or propane (these must match the fuel types specified in the ACM). Other options include “Not Paid by the Tenant,” and “N/A.”

Figure 3-3. Appliance Fuel Type



Heating Fuel: Natural Gas


Water Heating Fuel: Natural Gas

Cooking Fuel: Electric

3.3.2.3 Trash and Water Rate Type

If the tenants do not pay for water or trash, choose “Not Paid by the Tenant” for the rate type(s) inputs shown in Figure 3-4. If tenants pay for water, specify whether it is based on a flat monthly rate or a usage rate (\$/gallon). **NOTE:** If values for both “Water Flat Monthly Rate” and “Water \$/Gallon” are specified, CUAC will use both values to establish the tenant’s cost.

Figure 3-4. Trash/Water



Trash Rate Type: Flat monthly rate

Water Rate Type: Flat monthly rate

Trash Flat Monthly Rate: \$8.00

Water Flat Monthly Rate: \$25.00

Water \$/Gallon: \$0.000000

3.3.3 Apartment Details Tab

Select from the available apartment types (number of bedrooms) included in the project (see Figure 3-5). Indicate how many of those apartments are affordable housing vs. market rate units. Check the “High Efficacy” lighting checkbox (the most recent Energy Code requires high efficacy lighting with very few exceptions).

Figure 3-5. Apartment Inventory

Edit Apartment Rooms				
Input Apartments Inventory				
Apartment Type	# Affordable Housing Units	# Market Rate Housing Units	High Efficacy Lighting	
▶ One Bedroom	10	2	<input checked="" type="checkbox"/>	
Two Bedroom	30	2	<input checked="" type="checkbox"/>	
Three Bedroom	30	5	<input checked="" type="checkbox"/>	
*	0	0	<input type="checkbox"/>	

3.3.3.1 Edit Apartment Rooms

The CUAC has default assumptions about apartment layouts (see Figure 3-6). Rooms may be edited if the defaults do not match the project (for example, if a two-bedroom apartment has two bathrooms instead of one). White cells can be edited; grey cells are fixed.

Figure 3-6. Apartment Rooms

Number of Rooms By Apartment Type									Reset Default Values	Close
Code	Apt Type	Bedrooms	Baths	Kitchen	Dining	Living	Laundry	Water Gallons/Day		
B0	Studio	0.5	1	1	0	0.5	1	65		
B1	One Bedroom	1	1	1	0	1	1	130		
B2	Two Bedroom	2	1	1	1	1	1	195		
B3	Three Bedroom	3	2	1	1	1	1	260		
B4	Four Bedroom	4	2	1	1	1	1	325		
B5	Five Bedroom	5	3	1	1	1	1	390		
B6	Six Bedroom	6	3	1	1	1	1	455		

The “Water Gallons/Day” contains assumed water use based on 65 gallons/person/day. The number of people per unit is based on 1+ (1.5 x number of bedrooms). These values only matter if the tenants pay for metered water use. If changing these values, documentation must be submitted verifying that the tenants pay based on amount used to the affordable housing governing agency.

3.4 Step 3 - Energy Use from an ACM

Alternative calculation methods include, among other programs, CBECC-Res, CBECC-Com, and EnergyPro. For a full list of approved ACMs see the [CEC’s building energy efficiency standards](#)

[approved compliance programs webpage](https://www.energy.ca.gov/programs-and-opics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency-2) (https://www.energy.ca.gov/programs-and-opics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency-2).

Depending on the software type, programs (by default or as an option) generate a comma separated values (CSV) file. The CSV file includes the values for the proposed dwelling by end use. The proposed energy use file, "PROP.CSV," is opened in Excel and the needed values can be summed for the month.

3.4.1 ACM Modeling Approach

Although the simplest modeling approach for multifamily buildings is to model the whole building (2019 *Residential Compliance Manual*, Section 8.6), this will not yield the most accurate results.

The most accurate option is to determine the average energy use for all variations of each apartment configuration. For example, an apartment building in a hot climate that has three stories with 1-, 2-, and 3-bedroom apartments would be modeled to reflect the energy use of all building conditions for each of the dwelling unit types separately. This could include an upstairs corner unit with the largest area of windows facing west, an interior unit with windows on only one side, a downstairs corner unit. Depending on the building configuration, this could be three to six dwelling units per floor to represent each of the conditions. The energy use would be averaged to represent a typical energy use for that apartment configuration. If needed, the CEC has an Area Weighted Average Calculation Worksheet (CF1R-ENV-02) that may be download from [Energy Code Ace](https://energycodeace.com/content/get-forms) (<https://energycodeace.com/content/get-forms>).

If the task of modeling multiple unit types separately is unmanageable, perhaps use the largest energy using unit of each dwelling configuration for each building. For example, depending on climate, this could be the upstairs end unit with the predominant amount of glass facing west. Or it could be an inside bottom floor unit with windows on only the north orientation. Assume each unit of that type has the same performance profile. However, it must be noted that the tradeoff of simplified modeling is accuracy of energy use. Time saved by simplifying the modeling could result in higher utility allowances for the project, reducing the benefit of using CUAC.

3.4.2 ACM Cooling, Heating, Domestic Hot Water

There are three tabs associated with ACM inputs: cooling, heating, and domestic hot water (DHW). For each apartment type (number of bedrooms) enter the monthly total or average total energy use across all apartments of the same type in the appropriate row.

Figure 3-7. Heating Usage

Input Monthly kWh Usage													
Apartment Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
One Bedroom	32	86	11	29	0	1	0	0	0	0	11	28	
Two Bedroom	31	80	7	15	0	0	0	0	0	0	15	31	
Three Bedroom	40	103	8	17	0	0	0	0	0	0	19	40	

Input Monthly kBtu Usage													
Apartment Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
One Bedroom	1363.7	3722.5	482.6	1250.6	13.4	26.8	0	0	0	2.6	482.9	1220	
Two Bedroom	1342.1	3444.3	286.2	667.7	0.4	0.8	0	0	0	12	647	1344.2	
Three Bedroom	1746	4446	340.1	756.3	0	0	0	0	0	7.1	824.6	1732	

ACM Heating

As shown in Figure 3-7, for each end use, enter kilowatt hours (kWh) for electric use and thousands of British thermal units (kBtu) for gas use. Use source energy or non-time dependent valuation (TDV) energy values.

To account for all energy use, values from "PFOP.CSV" must be added from multiple columns. Cooling (Clg) + FanC are added together. Heating may include gas (Htg) and electric (HPHtg) + FanH. Domestic hot water may include gas and electric energy depending on the system type.

3.4.2.1 High-Rise Buildings

Generate a CSV file from the energy compliance software for high-rise buildings. In Excel, add only the appropriate values for input into the CUAC. This will prevent double-counting lighting and appliance energy use from an EnergyPro or similar energy compliance report sheet.

3.5 Step 4 - Lighting and Appliances

Lighting includes default information based on whether high efficacy lighting is checked on the apartment details tab.

Figure 3-8) if it can or will be installed in the dwelling units. If the developer will install ENERGY STAR® appliances, check that box (two check boxes for ENERGY STAR appliances). For dryers, CUAC has not been updated to allow ENERGY STAR as an option. Check if there is a dryer hook-up in the dwelling unit and the fuel type is either gas or electric.

Figure 3-8. Apartment Appliances

Input Apartments Appliances										
Apartment Type	All Energy Star	Has Washer	Washer is Energy Star	Has Dryer	Dryer Fuel	Has Dish Washer	Dish Washer is Energy Star	Has Refrigerator	Refrigerator is Energy Star	
One Bedroom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Electric	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Two Bedroom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Electric	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Three Bedroom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Electric	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

NOTE: For TCAC or CDLAC projects, specifying ENERGY STAR means the appliances will need to be installed and verified by a HERS Rater at the time CUAC is run for the “placed in service submittal.”

3.6 Step 5 - CEC-PV Calculator Output

The PV calculator within CUAC is used to determine the energy generated by the project’s PV system that will offset the tenants’ energy use. The monthly values entered in CUAC may be from a 2019 residential ACM, which use PVWatts for system sizing, or another approved PV calculator which provides the estimated kWh production by month for each system. Enter estimated production for each system and what percent of the energy is dedicated to the common areas of the building rather than the tenants’ dwelling unit. The balance of each system’s output (minus common area load) is allocated to dwelling units proportional to estimated energy use.

If the PV size is reported as an annual value rather than monthly, such as a community solar program, the value must be scaled before inputting the monthly kWh output in CUAC:

Table 3-1: Monthly Multiplier for Annual Solar

Month	Scalar/Multiplier
January	0.0468
February	0.0622
March	0.0856
April	0.0972
May	0.0991
June	0.1045
July	0.1080
August	0.1103
September	0.0957
October	0.0799
November	0.0727
December	0.0381

The annual PV system size is multiplied by the scalar to determine the correct input for the month. For example, if the proposed design is 3.75, January’s input is $0.0468 \times 3.75 = 0.1755$. Values up to four decimal places can be entered into CUAC.

3.6.1 Net Energy Metering

Under the current net energy metering (NEM) tariffs, excess energy generated by a PV system rolls over from one month to the next and is credited to the customer’s account for 12 months, then undergoes a “true-up” where the account is reset to zero. To determine if a project is eligible for this type of program, contact the local utility or CCA that will be serving the

building. NEM requires approval by the local utility to ensure compliance with Electric Tariff Rule 21, which is a requirement of the California Public Utilities Commission (CPUC).

As CUAC will not carry forward a negative energy balance from one month to the next, specific steps are needed to offer a net energy mimic and maintain accuracy of results. Make sure the amounts entered for peak generation months do not exceed estimated tenant use for those months. The remaining excess generation should be spread to one or more of the off-peak months.

For more information on NEM in low-rise residential buildings, see 2019 *Residential Compliance Manual*, Chapter 7, and Appendix C10.

3.6.2 Virtual Net Metering

The CUAC assumes the CPUC's virtual net metering requirement that the distribution of the PV generation benefits to tenants is "based on the relative size of a tenant's unit, consistent with the manner in which affordable housing rents are established" (Rulemaking 08-03-008, Decision 08-10-036, Date of Issuance 10/20/2008).

3.6.3 Multiple PV systems

Multiple PV systems can be combined in the following manner:

1. Combine all systems that serve only tenant spaces onto one line and specify zero as the percent allocated to the common area load.

Combine all systems that serve common area and tenant spaces onto another line and specify the percent of this system that offsets the common area load. If any system(s) serves only common area demand, do not include those in CUAC, as CUAC is for estimating tenant-paid utilities only. The "Common Area Percent" is the total common area demand served by the bundled PV system(s) divided by the total energy of all the PV systems in that bundle.

3.7 Step 6 - Verify Summary and Print Results

The last two tabs present the aggregate results of the inputs in kWh and kBtu. The end use summaries are listed by apartment types with the energy end use listed alphabetically. Included are daily average and annual total based on the monthly values input or assumed by the program.

Figure 3-9. Electric End Use Summary

Calculated kWh Usage By Electric End Use Summary										
Apartment Type	End Use	Daily Avg	Annual Total	Jan	Feb	Mar	Apr	May	Jun	Jul
One Bedroom	Cooking	1.7	624.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0
One Bedroom	Cooling	1.7	630.0	0.0	0.0	0.0	0.0	1.0	36.0	149.0
One Bedroom	DHW	0.9	320.0	38.0	35.0	28.0	20.0	19.0	20.0	22.0
One Bedroom	Dishwasher	0.1	48.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
One Bedroom	Dryer	2.0	720.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
One Bedroom	Heating	0.5	198.0	32.0	86.0	11.0	29.0	0.0	1.0	0.0
One Bedroom	Lighting	1.2	426.4	36.2	32.7	36.2	35.0	36.2	35.0	36.0
One Bedroom	Plug Loads	3.1	1,140.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
One Bedroom	Refrigerator	1.1	408.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0
One Bedroom	Washer	0.1	48.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0

3.7.1 Output Documents

CUAC can produce a submittal report (either annual or draft), and a project details report.

3.7.1.1 Submittal Report (Annual or Draft) with Signature Page

The submittal report displays the estimated average monthly utility costs by apartment configuration and is submitted to TCAC, CDLAC, or housing programs when proposing a new project for applying for LIHTCs or federal HOME Program funds. This form resembles HUD Form 52667.

The form must be signed by a qualified consultant and the developer. For LIHTC projects, TCAC requires that the signing consultant be a CABEC CEA *and* either a certified HERS Rater or a California licensed Mechanical Engineer or Electrical Engineer (Section 1.1).

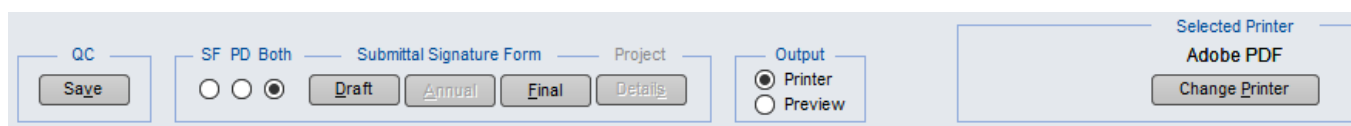
The submitted form has spaces for the CEA and project owner signatures (attesting to the accuracy of the inputs), printed name, title (for example, consultant, owner), company name, phone number, CEA certification number, and date.

3.7.1.2 Project Details

The project details list all CUAC inputs and the calculated results. It is typically 6-8 pages long. These detailed input sheets should be attached to the summary form when applying for funding from TCAC or other agencies so the accuracy can be verified if any questions arise.

3.7.2 Final/Draft (Print)

Figure 3-10. Save/Print Selections



To print (or preview) results:

- Click on QC/Save,

- Verify the selected printer,
- Choose output as either printer or preview,
- Select which reports to print (summary report, project detail report, or both), and
- Click on "Draft" (or "Final" which locks the inputs from any further editing).

While CUAC is working to produce the report(s), a banner (see Figure 3-12) appears to let the user know it is compiling the data for the report.

Figure 3-11. Print Status Banner

A horizontal yellow banner with a thin black border. The text inside is centered and reads: "Generating Draft Submittal Signature Form and Project Details Report . . . standby . . .".

Generating Draft Submittal Signature Form and Project Details Report . . . standby . . .

NOTE: Printing from preview is not an available option.

APPENDIX A: Utility Abbreviations

Input Name	Full Utility Name
Alameda	Alameda Municipal Power
Anaheim	Anaheim Public Utilities Department
Anza	Anza Electric Cooperative
Azusa	Azusa Light and Water
Banning	Banning Electric Utility
Bear	Golden State Water Company
Biggs	Biggs Municipal Utilities
Burbank	Burbank Water and Power
Colton	Colton Electric Utility
Corona	City of Corona
Glendale	Glendale Water and Power
Gridley	Gridley Electric Utility
HLDBGMU	Healdsburg Municipal Utility
Imperial	Imperial Irrigation District
Island	Island Energy
Kirkwood	Kirkwood Meadows Public Utility District
LADWP	Los Angeles Department of Water and Power
Lathrop	Lathrop Irrigation District
LBGO	Long Beach Gas & Oil Department
Liberty	Liberty Utilities
LMUD	Lassen Municipal Utility District
LMUD-SIR	Lassen Municipal Utility District – Susanville Indian Rancheria
Lodi	Lodi Electric Utility
Lompoc	Lompoc Electric Utility
Merced	Merced Irrigation District
MOID	Modesto Irrigation District
MOID-MH	Modesto Irrigation District – Mountain House Community Svc Dist
Moreno	Moreno Valley Utility
Needles	Needles Public Utility Authority
No Gas	No Gas-All Electric
Palo Alto	City of Palo Alto Utilities
Pasadena	City of Pasadena
PG&E	Pacific Gas and Electric
PP&L-DN	Pacific Power and Light - Del Norte County
PP&L-Othr	Pacific Power and Light-Other Locations

Input Name	Full Utility Name
Propane	Propane instead of natural gas / no utility
P-SREC	Plumas-Sierra Rural Electric Cooperative
Rancho	Rancho Cucamonga Municipal Utility
Redding	Redding Electric Utility
Riverside	Riverside Public Utilities
Roseville	City of Roseville Utilities
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SFPUC	Power Enterprise of the San Francisco Public Utilities Commission
Shelter	Shelter Cove Resort Improvement District
Silicon	Silicon Valley Power
SLMU	Shasta Lake Municipal Utility
SMUD	Sacramento Municipal Utility District
SoCalGas	Sothern California Gas
SVEC	Surprise Valley Electrification Corporation
SWG-NorCal	Southwest Gas Corporation-Northern California
SWG-SLT	Southwest Gas Corporation-South Lake Tahoe
SWG-SoCal	Southwest Gas Corporation-Southern California
TDPUD	Truckee Donner Public Utility District
TID	Turlock Irrigation District
TID-West	Turlock Irrigation District – Westside Zone
Trinity-A	Trinity Public Utilities District Zone A
Trinity-B	Trinity Public Utilities District Zone B
Ukiah	Ukiah Municipal Utility District

APPENDIX B: Glossary

ACM	alternative calculation method
APN	assessor's parcel number
CABEC	California Association of Building Energy Consultants
CARE	California alternate rates for energy
CBECC	California Building Energy Code Compliance
CCA	community choice aggregator
CDLAC	California Debt Allocation Committee
CEA	certified energy analyst
CEC	California Energy Commission
CPUC	California Public Utilities Commission
CSV	comma separated values
CUAC	California utility allowance calculator
DWH	domestic water heating
HERS	home energy rating system
HOME	federal HOME investment partnerships program
kBtu	thousands of British thermal units
kWh	kilowatt hour
LIHTC	low-income housing tax credits
MASH	multifamily affordable solar housing
NEM	net energy metering
PV	photovoltaics
QC	quality control
SOMAH	solar on multifamily affordable housing
TCAC	Tax Credit Allocation Committee
TDV	time dependent valuation