



California Energy Commission

2025 California Building Energy Compliance Software Update

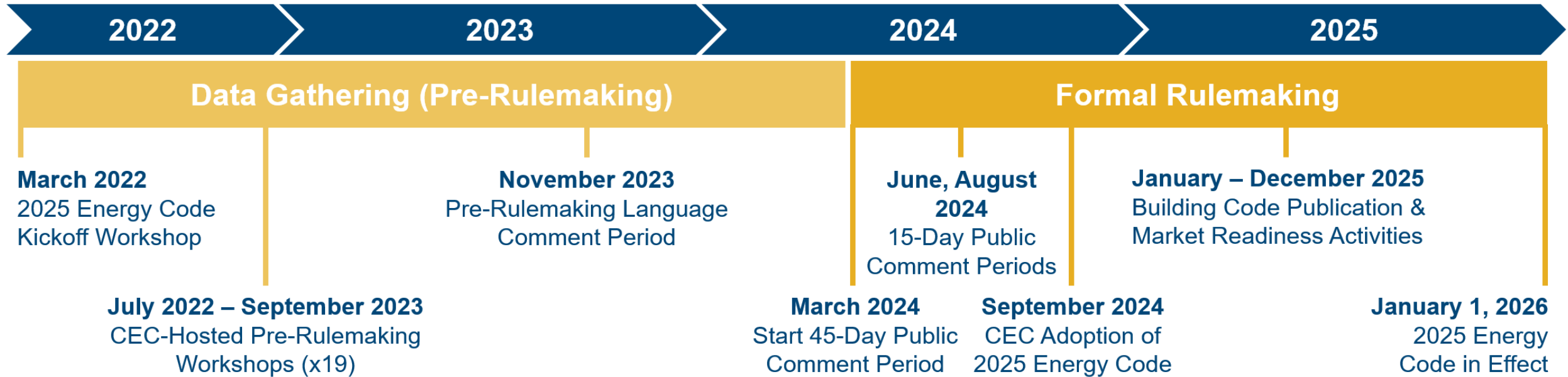
Nikhil Kapur, Program and Project Supervisor

November 19, 2025




Where are we? – 2025 Energy Code

We are here

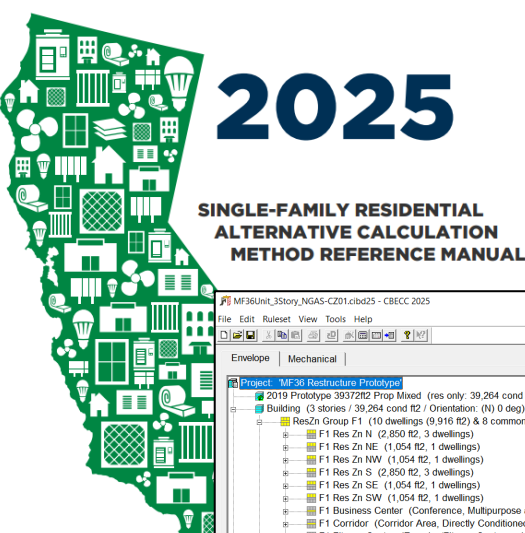




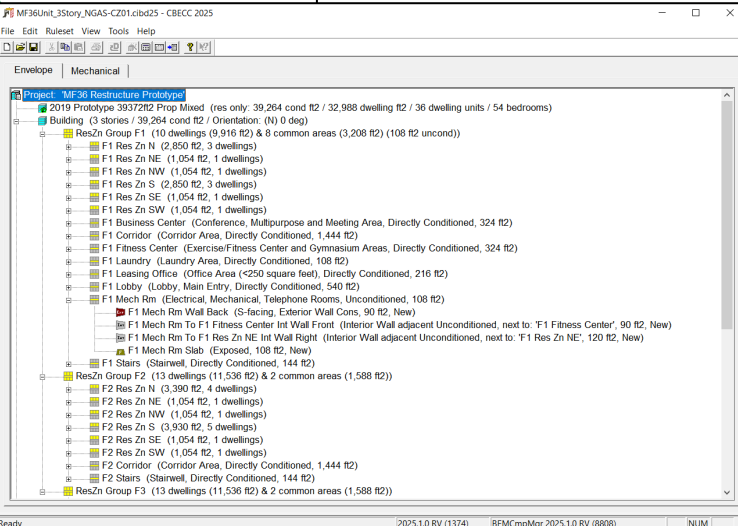
2025 Compliance Software



2025
NONRESIDENTIAL AND
MULTIFAMILY ALTERNATIVE
CALCULATION METHOD
REFERENCE MANUAL



2025
SINGLE-FAMILY RESIDENTIAL
ALTERNATIVE CALCULATION
METHOD REFERENCE MANUAL



Project: MF36 Restructure Prototype
2019 Prototype 3937212 Prop Mixed (res only: 39,264 cond ft2 / 32,988 dwelling ft2 / 36 dwelling units / 54 bedrooms)
Building (3 stories / 39,264 cond ft2 / Orientation: (N) 0 deg)
ResZn Group F1 (10 dwellings (9,916 ft2) & 8 common areas (3,208 ft2) (108 ft2 uncond))
F1 Res Zn N (2,850 ft2, 3 dwellings)
F1 Res Zn NE (1,054 ft2, 1 dwellings)
F1 Res Zn NW (1,054 ft2, 1 dwellings)
F1 Res Zn S (2,850 ft2, 3 dwellings)
F1 Res Zn SE (1,054 ft2, 1 dwellings)
F1 Res Zn SW (1,054 ft2, 1 dwellings)
F1 Business Center (Conference, Multipurpose and Meeting Area, Directly Conditioned, 324 ft2)
F1 Corridor (Corridor Area, Directly Conditioned, 1,444 ft2)
F1 Fitness Center (Exercise/Fitness Center and Gymnasium Areas, Directly Conditioned, 324 ft2)
F1 Laundry (Laundry Area, Directly Conditioned, 108 ft2)
F1 Leasing Office (Office Area (<250 square feet), Directly Conditioned, 216 ft2)
F1 Lobby (Lobby, Main Entry, Directly Conditioned, 540 ft2)
F1 Mech Rm (Electrical, Mechanical, Telephone Rooms, Unconditioned, 108 ft2)
F1 Mech Rm Wall Back (S-facing, Exterior Wall Cons, 90 ft2, New)
F1 Mech Rm To F1 Fitness Center Int Wall Front (Interior Wall adjacent Unconditioned, next to: "F1 Fitness Center", 90 ft2, New)
F1 Mech Rm To F1 Res Zn NE Int Wall Right (Interior Wall adjacent Unconditioned, next to: "F1 Res Zn NE", 120 ft2, New)
F1 Mech Rm Slab (Exposed, 108 ft2, New)
F1 Stairs (Stairwell, Directly Conditioned, 144 ft2)
ResZn Group F2 (13 dwellings (11,536 ft2) & 2 common areas (1,588 ft2))
F2 Res Zn N (3,990 ft2, 4 dwellings)
F2 Res Zn NE (1,054 ft2, 1 dwellings)
F2 Res Zn NW (1,054 ft2, 1 dwellings)
F2 Res Zn S (3,930 ft2, 5 dwellings)
F2 Res Zn SE (1,054 ft2, 1 dwellings)
F2 Res Zn SW (1,054 ft2, 1 dwellings)
F2 Corridor (Corridor Area, Directly Conditioned, 1,444 ft2)
F2 Stairs (Stairwell, Directly Conditioned, 144 ft2)
ResZn Group F3 (13 dwellings (11,536 ft2) & 2 common areas (1,588 ft2))

	Milestone	Timing
✓	2025.1.0 RV's (Research Versions)	April '25
✓	2025.1.0 RC's (Release Candidates)	May '25
✓	2025 ACM Reference Manual Adoption and CBECC 2025.1.0 Approval	June '25
✓	2025.2.0 CBECC	Nov '25
	Third-party Software Approvals	ASAP
	2025 Energy Code Effective Date	January '26



2025.2.0 Software Updates

- **Aligns to updated ACM modeling rules**
 - Enhancements, corrections, bug fixes, etc.
- **Unification of all building types into CBECC**
 - New unified program supports performance compliance for single-family, multifamily, and nonresidential occupancies.
 - A dedicated single-family program, CBECC-Res, will no longer be supported.
- **Nonresidential simulation engine update**
 - Updating to the newest version of EnergyPlus, 25.1.0, to improve modeling accuracy and features.
- **Approval given at the October 8th CEC Business Meeting**



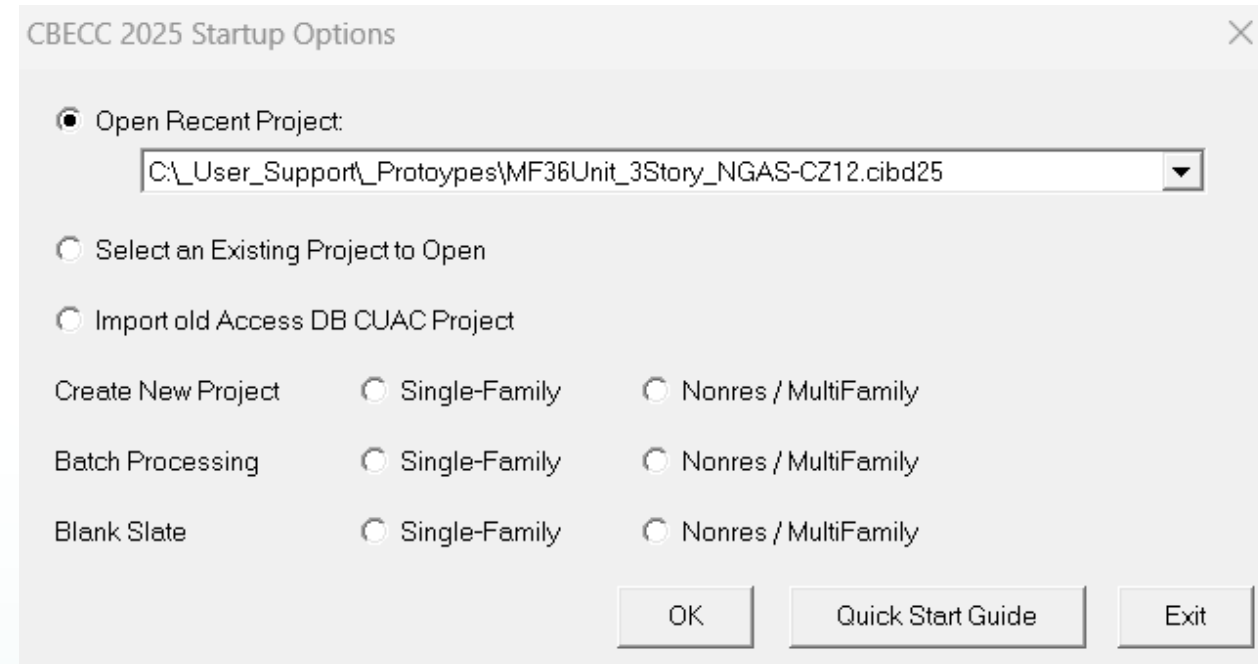
2025 Software Highlights

- **Unified CBECC application for nonresidential, residential, and multifamily compliance**
- **Support for Executive Order N-29-25 (LA Fires PV/Battery Exception)**
- **Nonresidential / Multifamily**
 - New Air to Water Heat Pump (AWHP)
 - Removal of Tailored Lighting Method
 - Ventilation updates (Balanced or supply only, HRV/ERV, and FID requirements)
 - Common area lighting updates
- **Single Family**
 - Unitary AC and HP Modeling (Variable capacity heat pump -VCHP)
 - Dual heat pump standard design in all climate zones
 - Switch from EDR to LSC, Source, and Peak Cooling metrics
- **NRCC/LMCC PRF & CF-1R Reporting Updates**



Unified User Interface

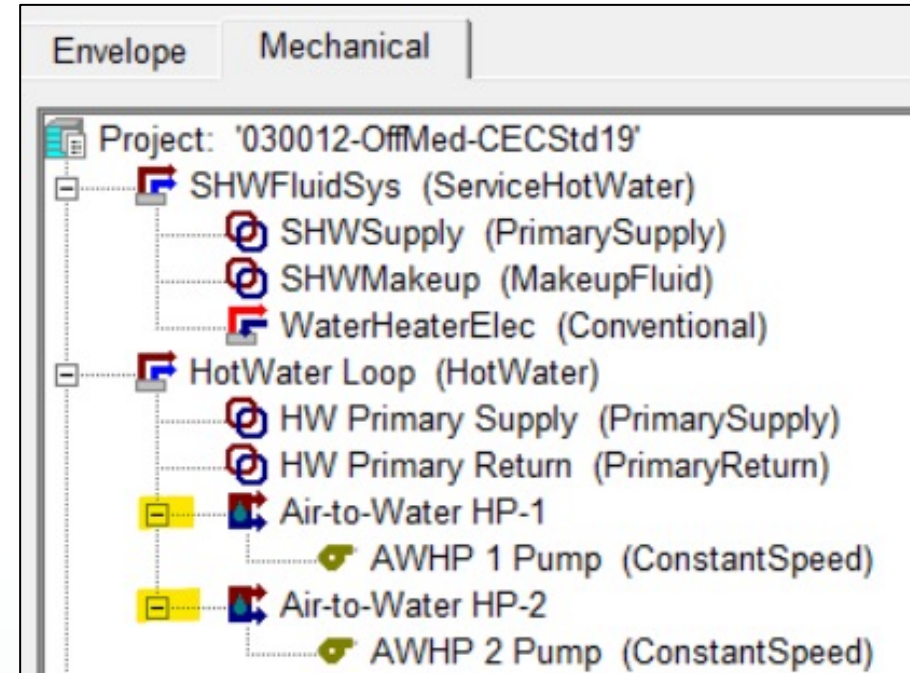
- One CBECC application for all building types, nonresidential, residential, and multifamily
- No changes to user interface from previous CBECC and CBECC-Res once a model file is opened/started
- Combined Quick-Start Guide
- Future: Combined User Manual and ACM Reference Manual





New Air to Water Heat Pump (AWHP)

- New AWHP object
- Based on new EnergyPlus AWHP-EIR
- Used in multizone standard designs with AWHP's



Heat Pump Data	
Currently Active Heat Pump: Air-to-Water HP-1	
Name:	Air-to-Water HP-1
Status:	New
Rated Ent/Lvg Wtr Temp:	120 F/140 F
Rated Heating Capacity:	411,615 Btu/h
Flow Rate:	82.29 gpm
Rated Heating COP:	2.31
Compressor location:	Outdoor
Load Inlet FluidSeg:	HW Primary Return
Load Outlet FluidSeg:	HW Primary Supply
Defrost Control:	TimedEmpirical
Defrost Temp.:	50.0 °F
Min Part Ld Ratio:	0.20
Cprsr Lockout Temp:	0.00
Supplemental Boiler:	- none -



Unitary AC and HP Modeling

- New AC and HP modeling method
- Supports single and multispeed AC and HP modeling
- Replaces Variable Capacity Heat Pump (VCHP) compliance option and previous “detailed” VCHP modeling method
- Replaces old single speed AC modeling method
- Based on [RESNET publication 003-2025](#)

Heat Pump Data | Detailed Performance Data

Currently Active Heat Pump System: **ResidentialHeatPumpSystem 2**

Name: **ResidentialHeatPumpSystem 2**

Type: **SplitHeatPump - Ducted central split heat pump**

SplitHeatPump: Central split system heat pump heating systems. Distribution system shall be one of the ducted systems. [Efficiency Metric: HSPF]

Efficiency Metric(s): **HSPF2/SEER2/EER2**

Heating Performance: **Variable** Speed

HSPF2: **7.5** ratio

Cooling Performance:

SEER2: **14.3**

EER2: **11.7**

Cap @ 95°F: **22,889** Btuh

CFM per Ton: **350** CFM/ton

AC Charge: **Verified**

Refrigerant: **R410A**

☐ Auto-Size Capacity

Cap (Btuh)

@ 47°F: **24,000**

@ 17°F: **16,536**

☐ Zonally Controlled

Backup: **Electric Resistance**

Sizing Factor: **1.2** ratio



LA Fire PV/Battery Suspension

- CBECC-Res:
2022

Project Analysis EDR / PV Battery Notes Building Appliances /

Project Name: 1 Story Example PV+Battery

Building Address: 715 P Street

City, State: Sacramento, CA

Zip Code: 95814

Climate Zone: CZ12 (Sacramento)

☐ Project subject to Executive Order N-29-25

- [Executive Order N-29-25](#)
- Suspends PV and Battery requirements for residential structures impacted by LA fires

- CBECC:
2022/2025

Project Team Narrative Analysis Options PV/Battery Forms Exceptional Conditions CUAC CALGreen E+ Variables Utility Rates

Project Name: MF36 Restructure Prototype Fuel Type: NaturalGas

Run Title: MF36 Restructure Prototype Generate Report(s): ☒ PDF ☐ Full (XML) Geometry Input: Detailed

Analysis Type: Title24Compliance ☐ Quick Analysis (Report WATERMARKED) ☒ Includes Residential Dwellings &/or Common Areas

Appliance Standards Version: Compliance2022 Efficiency Metric: SEER/EER/HSPF

☐ Project subject to Executive Order N-29-25

- EnergyPro:

Project Design Data Project Title Designer Lighting Mechanical Forms Misc Utility Outdoor Exterior Uses Pools PV+Batt

☐ Use Community Solar (Zones 11 & 12 Only) ☐ This project is located in the SMUD Neighborhood SolarShares territory to the best of my knowledge

☐ Exempt from Solar per Executive Order



PV Updates

- PV exceptions are now automatic in CBECC (with the option to override)
- Single family standard design PV capacity based on prescriptive requirements alone (no more sizing run for PV)

Solar Access Roof Area: ft²

Pct Steep-sloped SARA: %

☒ Default PV Exceptions

☐ Reduced PV Requirement

14. **Photovoltaic requirements.** All single-family residential buildings shall have a newly installed photovoltaic (PV) system or newly installed PV modules meeting the minimum qualification requirements specified in Joint Appendix JA11. The annual electrical output of the PV system shall be no less than the smaller of a PV system size determined using Equation 150.1-C, or the total solar access roof area (SARA) multiplied by 18 for steep-sloped roofs or multiplied by 14 for low-sloped roofs.

A. SARA includes the area of the building's roof space capable of structurally supporting a PV system, and the area of all roof space on covered parking areas, carports, and all other newly constructed structures on the site that are compatible with supporting a PV system per Title 24, Part 2, Section 1511.10.

EQUATION 150.1-C ANNUAL PHOTOVOLTAIC ELECTRICAL OUTPUT

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



Reporting Updates: CF-1R / NRCC / LMCC

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD		NRCC-PRF-E
Nonresidential Performance Compliance Method		(Page 1 of 20)
Project Name:	020012-OffSml-CECStd25	Date Prepared: 2025-11-07

A. General Information

1	Project Name	020012-OffSml-CECStd25
2	Run Title	
3	Project Location	- specify -
4	City	- specify -
5	Standards Version	
6	Zip code	95814
7	Compliance Method	
8	Climate Zone	12
9	Building Orientation	
10	Building Type(s)	• Nonresidential
11	Weather File	
12	Project Scope	• New complete scope
13	Number of Buildings	
14	Total Conditioned Floor Area in Scope (ft²)	5502.05
15	Total # of Habitable Units	
16	Total Unconditioned Floor Area (ft²)	0
17	Fuel Type	
18	Is Natural Gas Available per Section 100.1?	Yes
19	Nonresidential Floor Area	
20	Total # of Stories (Habitable Above Grade)	1
21	Residential Area	

CA Building Energy Efficiency Standards - 2025 Nonresidential Compliance

Report Version: 2025.0.0
Schema Version: rev 202

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: 2 Story 2 Zone PV, Battery, Self-Utilization

Calculation Date/Time: 2025-11-06T22:12:23-08:00

Calculation Description: 2 Zone Top/Bot, 2 GasFurn SplitAC Systems

Input File Name: 2story2zoneExample-EO.ribd25

CF1R-PRF-01-E

(Page 1 of 12)

GENERAL INFORMATION

01	Project Name	2 Story 2 Zone PV, Battery, Self-Utilization
02	Run Title	2 Zone Top/Bot, 2 GasFurn SplitAC Systems
03	Project Location	715 P Street
04	City	Sacramento, CA
05	Standards Version	2025
06	Zip code	95814
07	Software Version	CBECC 2025.2.0
08	Climate Zone	9
09	Front Orientation (deg/ Cardinal)	0
10	Building Type	Single family
11	Number of Dwelling Units	1
12	Project Scope	Newly Constructed
13	Number of Bedrooms	4
14	Addition Cond. Floor Area (ft²)	0
15	Number of Stories	2
16	Existing Cond. Floor Area (ft²)	n/a
17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft²)	2700
19	Glazing Percentage (%)	20.00%
20	ADU Bedroom Count	n/a
21	ADU Conditioned Floor Area	n/a
22	Fuel Type	Natural gas
23	No Dwelling Unit:	No

COMPLIANCE RESULTS

Building Complies with Computer Performance

This building incorporates features that require field testing and/or verification by a certified ECC rater under the supervision of a CEC-approved ECC provider.

This building incorporates one or more Special Features shown below.

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- Solar Electric Generation Systems / Solar PV System requirements for newly constructed residential buildings are suspended per Executive Order N-29-25
- Whole house fan
- Cool roof
- Insulation below roof deck
- Non-standard duct location (any location other than attic)



CA Utility Allowance Calculator (CUAC)

- CUAC is now available for single family projects using the residential CBECC interface
- Multifamily projects continue to use the CBECC interface
- New project combination tool allows multiple project results to be combined after being processed by the CUAC tool
- Rate updates are included in CBECC 2025.2.0

The screenshot shows the 'Building Model Data' application window with a tabbed interface. The 'CUAC' tab is selected. A 'Combining CUAC Reports' dialog box is open, featuring the following fields and buttons:

- Directory containing CSV files to combine (optional):** A text input field with a browse button (...).
- Specify each of the CUAC report .CSV files to be combined (req'd):** A list of input fields, with the first one labeled '1)' and a browse button (...).
- Clear Following CSV Entries:** A button to clear the list of files.
- Path and file name of the combined CUAC results files (req'd):** A text input field with a browse button (...).
- Combine CUAC Reports:** A button at the bottom of the dialog.



2025 Metrics Updates Summary

- **Terminology:** Updated terminology for the Energy Code cost-effectiveness metric from Time Dependent Valuation (TDV) to Long-term System Cost (LSC).
- **Units:** Time dependent metric unit, LSC, simplified to \$/kWh and \$/therm. Previous code cycles did extra steps to convert to energy only units, kBtu/kWh and kBtu/therm.
- **Clean-up:** Switching from Energy Design Rating (EDR) for single-family to LSC and Source aligning with nonresidential and multifamily.
- **Additions:** New peak cooling metric for single-family residential.



2025 Metrics Summary

Single family:

1. **LSC Efficiency:** LSC for all efficiency measures (no PV/Battery)
2. **LSC Total:** LSC for all efficiency measures (efficiency LSC) and the LSC for all flexibility measures (PV/Battery).
3. **Source Energy**
4. **Peak Cooling < 120% of Standard Design peak cooling energy**

Peak cooling energy is the total annual mechanical cooling site energy, in kWh, that occurs at peak hours between 4 pm and 9 pm from July through November. Applicable in Climate zones 4 and 8 through 15.

Nonresidential and Multifamily:

1. **LSC Efficiency:** LSC for all efficiency measures (no PV/Battery)
2. **LSC Total:** LSC for all efficiency measures (efficiency LSC) and the LSC for all flexibility measures (PV/Battery).
3. **Source Energy**



Current/Future Software Work

- **GitHub development and repository**
 - Current repository: <https://github.com/NOR-Codes-Std/CBECC>
 - Final repository destination: California Energy Commission GitHub - <https://github.com/california-energy-commission>
- **2025**
 - Executive Director approvals for multizone HP alternatives (Section 140.4(a)3Av)
 - Third party software approvals as applications are received
 - 2025 software/UI/reporting enhancements and new features
- **2028**
 - 2028 CBECC
 - [Proposed updates to LSC and Source Energy metrics and weather data](#)
 - [Proposed updates to equipment power densities and building schedules](#)
 - [Proposed updates to building prototypes](#)



Software Resources

- [Building Energy Efficiency Standards Subscription](#)
 - Notification for docketed material, workshops, software releases and approvals, business meeting notices
- Energy Code Homepages
 - Links to dockets, presentations, important dates, backup material
 - [2022](#), [2025](#), [2028](#)
- Compliance Software Webpages
 - [2022](#), [2025](#)
- CBECC GitHub Repository: <https://github.com/NOR-Codes-Stds/CBECC>
 - Code repository, CBECC Wiki and FAQ (coming soon)
- Support: CBECC@energy.ca.gov and CBECC.Res@energy.ca.gov
- Industry Groups: [CABEC](#), [CaIBEM](#), [IBPSA-USA](#)



Thank You!