DOCKETED	
Docket Number:	24-BSTD-03
Project Title:	2025 Energy Code Compliance Software, Manuals and Forms
TN #:	267721
Document Title:	Peak Cooling Metric Will Have Unintended Consequences
Description:	Early analysis using CBECC 2025 v2 indicate that compliance with the peak cooling metric for new single family projects will be difficult, even on typical mainstream projects. We suggest some remedies to improve the situation.
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BUILD SMART

Nick Brown
R22-15-40004

November 21, 2025

RE: Peak Cooling Metric

Executive Summary

I believe that the addition of the Peak Cooling (PC) metric to the 2025 performance pathway for new single family homes will have difficult unintended consequences on many projects. Recent modeling runs in the 2025 software v2.0 show that typical projects routinely fail the Peak Cooling metric when other metrics comply, and it does not take extraordinary design choices to cause PC to fail. Also, luxury homes with glazing over prescriptive standard 20% fail Peak Cooling severely.

In order to minimize complaints from various stakeholders, I recommend, in order of preference:

(1) eliminating the PC metric;

(2) allowing for a wider margin above the standard design PC for compliance;

(3) focusing not on cooling but peak electricity usage; or

(4) factoring in PV, battery, and other flexibility measures to PC calculations.

Recent Runs Illustrate the Problem

We have only begun to test the 2025 software, so the challenge presented by the PC metric is not fully known yet, but consider this typical project that would have passed in the 2022 code:

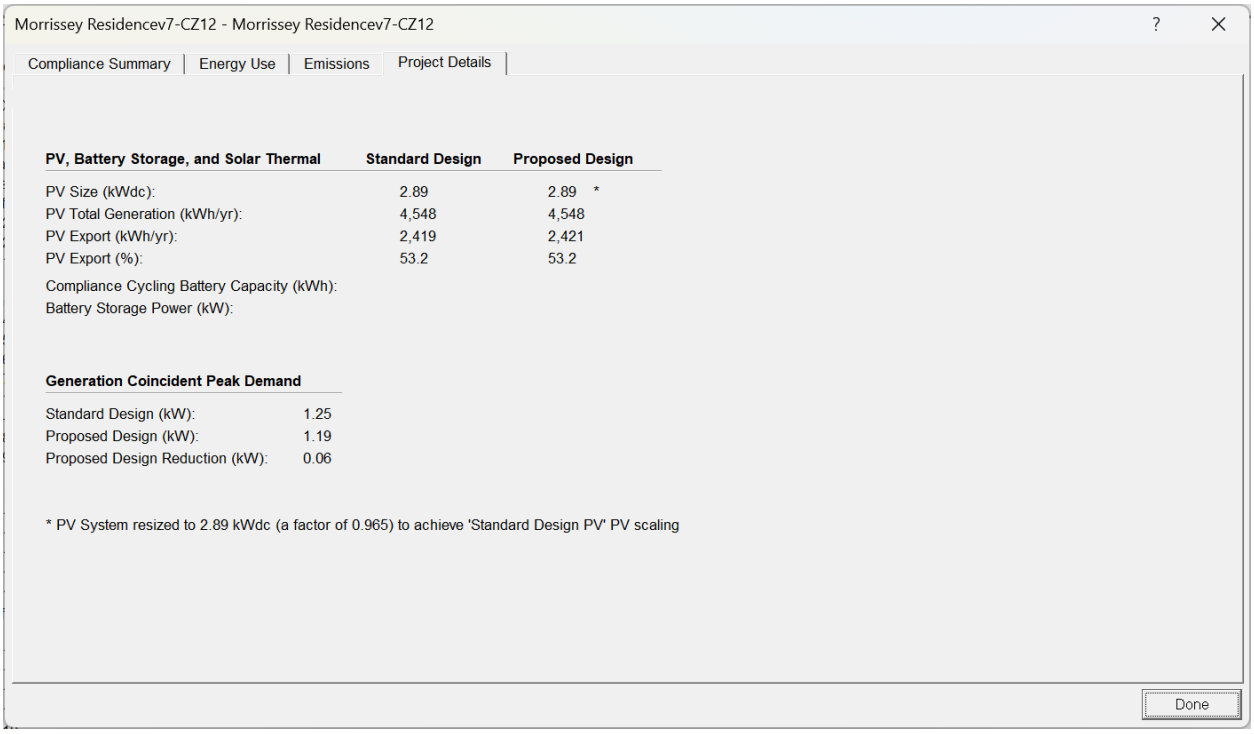
- Altadena like-for-like fire rebuild (Climate Zone 9)
- 2-story, 2437 square feet, 3 bedrooms
- 22% glazing with two 4'x4' skylights, average U-factor 0.31, average SHGC 0.24
- 5-ton Ducted heat pump 15 SEER2, 9 HSPF2, ducts in crawl
- Rheem HPWH 80-gallon in attached garage
- 2x6 R-21 walls
- R-38 cathedral ceilings, R-38+R-4 small attic
- Prescriptive whole house fan

When we run this typical project, it passes on LSCe, LSCt, and Source, but fails peak cooling in every climate zone (4,8-15). This is not an unreasonable project design and

for it to fail in every applicable PC climate zone indicates that more challenging project designs are going to have serious trouble complying with the energy code.

Climate Zone	LSCe margin	LSCt margin	Source margin	Peak Cooling Margin
4	0.5	0.1	3.55	-45
8	0.06	0.01	3.31	-40
9	0.21	0.15	3.35	-30
10	0.15	0.05	3.29	-16
11	0.38	0.32	3.30	-1
12	0.54	0.55	3.53	-69
13	0.27	0.21	3.27	-27
14	0.28	0.24	3.17	-4
15	-0.62	-0.44	2.67	+24

Using Climate Zone 12 as an example, it uses 69 kWh too many for peak cooling to comply. Note that its generation coincident peak kW is actually below the standard design by 0.06 kW, but it fails peak cooling. This illustrates that the PC metric is not successfully identifying projects that will be a grid burden, but rather is doing something more arbitrary.



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To get this project into compliance, the following feature upgrades were effective:

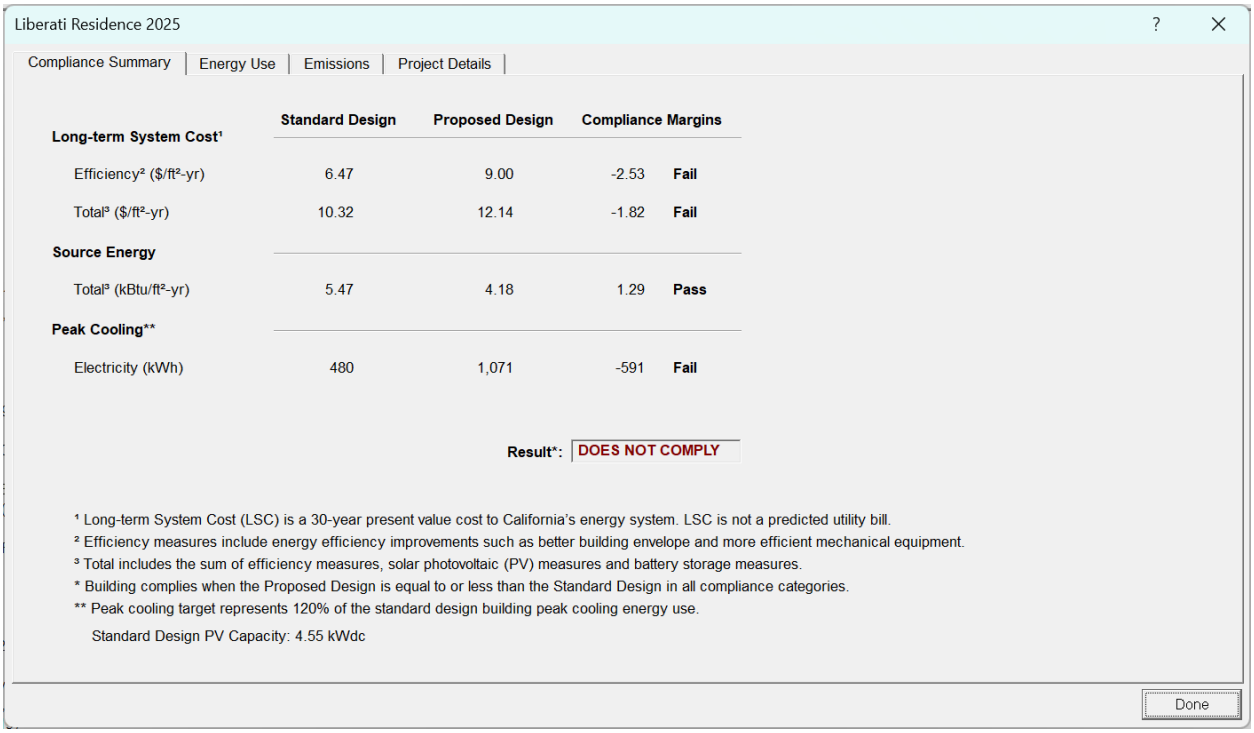
1) Whole house fan 5,170 cfm ECC verified, 0.14 W/cfm

Features that would be expensive upgrades but that were ineffective included:

1) Adding R-4 continuous insulation to walls (reduced PC by 12 but still out of compliance)
2) Moving HPWH inside (reduced PC by 43 but still out of compliance)
3) Reducing window SHGC from 0.23 to 0.21 (reduced PC by 31 but still out of compliance)
4) Increasing HP efficiency to 20 SEER2 (reduced PC by 22 but still out of compliance)

Luxury Homes Fail Severely

This firm regularly gets projects with 40% glazing or more for affluent homeowners with homes with views. When I ran one of these in CZ10 with the mandatory updates to window U factors and meeting cathedral ceiling prescriptive standards, this project is so far out of compliance on peak cooling that it may be impossible to get it to comply. Note that Efficiency LSC is also out of compliance, but HRV and battery may get that to work.



Liberati Residence 2025

Compliance Summary | Energy Use | Emissions | Project Details

	Standard Design	Proposed Design	Compliance Margins	
Long-term System Cost[1]				
Efficiency[2] ($/ft²-yr)	6.47	9.00	-2.53	**Fail**
Total[3] ($/ft²-yr)	10.32	12.14	-1.82	**Fail**
Source Energy				
Total[3] (kBtu/ft²-yr)	5.47	4.18	1.29	**Pass**
Peak Cooling**				
Electricity (kWh)	480	1,071	-591	**Fail**

Result*: DOES NOT COMPLY

[1] Long-term System Cost (LSC) is a 30-year present value cost to California's energy system. LSC is not a predicted utility bill.
[2] Efficiency measures include energy efficiency improvements such as better building envelope and more efficient mechanical equipment.
[3] Total includes the sum of efficiency measures, solar photovoltaic (PV) measures and battery storage measures.
* Building complies when the Proposed Design is equal to or less than the Standard Design in all compliance categories.
** Peak cooling target represents 120% of the standard design building peak cooling energy use.
Standard Design PV Capacity: 4.55 kWdc

Done

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Summary

Now that we've had some time to run some real-world projects in the 2025 CBECC software, we have real concerns about the addition of Peak Cooling as a compliance metric. We recommend, in order of preference:

(1) eliminating the PC metric;

(2) allowing for a wider margin above the standard design PC for compliance;

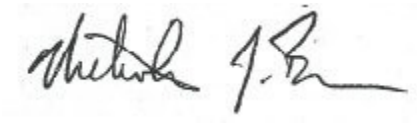
(3) focusing not on cooling but peak electricity usage; or

(4) factoring in PV, battery, and other flexibility measures to PC calculations.

Recent attention in the California legislature show that the energy code is perceived as an obstacle to building the cost-effective housing we need (AB 130). When we find parts of the code that may exacerbate these perceptions, we need to take action.

I am happy to share the model files used for this analysis or discuss this issue in more detail.

Sincerely,



Nick Brown
President