CBECC-Res 2019.0.4 Research Version – June 15, 2017

Welcome to the CBECC-Res 2019.0.4 Research Version. This software is intended for users who need to be able to do performance calculations as part of the 2019 standards setting process.

This version represents the draft 2019 standards at this point in time, but the process is not complete. As the 2019 process progresses, it is likely the calculations and results will change.

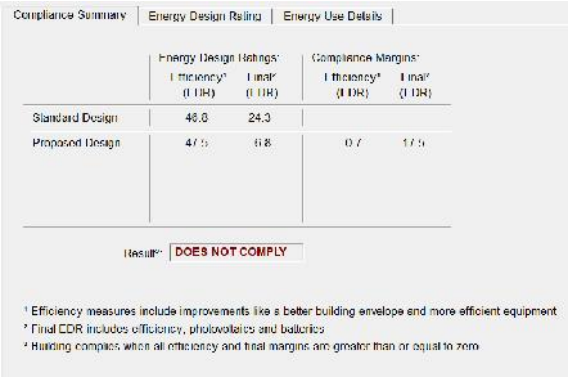
Energy design Rating (EDR):

CBECC-Res 2019 uses an energy design rating (EDR) metric to demonstrate compliance with the standards. EDR uses a 2006 IECC compliant building as the reference building; a building that just complies with the IECC home performance level has an EDR score of 100; a zero net energy (ZNE) home has an EDR score of zero. The lower the EDR, the better the building performs. The California version of the EDR uses TDV as the metric for energy.

The EDR is imbedded into CBECC-Res and has two parts:

1. An "Efficiency EDR" for energy efficiency features of the building
2. A "Final EDR" that combines the efficiency EDR and credit for PV with demand flexibility

For a building to comply, two criteria are required: (1) the proposed efficiency EDR must be equal to or smaller than the efficiency EDR of the standard design, and (2) the final proposed EDR must be equal to or less than the final standard design EDR target. This concept allows the user to specify more energy efficiency features and less PV and still comply, as long as the efficiency and final EDR scores meet or exceed their targets.


Compliance Summary | Energy Design Rating | Energy Use Details

	Energy Design Ratings:		Compliance Margins:	
	Efficiency[1] (EDR)	Final[2] (EDR)	Efficiency[1] (EDR)	Final[2] (EDR)
Standard Design	46.6	24.3		
Proposed Design	47.5	6.8	0.7	17.5

Result[3]: DOES NOT COMPLY

[1] Efficiency measures include improvements like a better building envelope and more efficient equipment
[2] Final EDR includes efficiency, photovoltaics and batteries
[3] Building complies when all efficiency and final margins are greater than or equal to zero

The compliance summary (example above) is available in CBECC-Res following an analysis. It compares the efficiency and final EDRs and shows whether the proposed design complies or not. For compliance, BOTH EDR compliance margins must be 0 or greater. More details are shown on the Energy Design Rating and Energy Use Details tabs.

The software also allows the user to claim significant final EDR credit for demand flexibility measures, including battery storage. PV and demand flexibility measures do not affect the efficiency EDR. Demand response heat pump water heaters, and precooling strategies are under development, and are not included in this release. These strategies are useful for buildings trying to achieve low EDR scores approaching full zero net energy (ZNE), which may be required as part of local ordinances.

Battery Control:

CBECC-Res awards EDR credit for a battery storage system that is coupled with a PV array. The specified battery storage size must be 6 kWh or larger. The EDR contribution for batteries will only impact the "EDR of Proposed PV + Flexibility" and not the "EDR of Proposed Efficiency".

There are two control options available for batteries: a "default control" with a modest EDR credit, and a "best case control":

> Default Control – A simple control strategy that awards a modest EDR credit. When this option is chosen, the software assumes that the batteries are charged anytime PV generation (generation) is greater than the house load (load), and conversely, the batteries are discharged when load exceeds generation.
>
> Best Case Control – A more sophisticated control strategy that will maximize the TDV value of the stored kWh. When this option is selected, the software assumes that the batteries are charged when generation exceeds the load; however, the batteries will only discharge during the highest "anticipated" TDV intervals to maximize the value of the stored kWh. This strategy may require control by the local utility or a more sophisticated control strategy provided by the manufacturer of the battery system.

PV Sizing Limit – For Part 6 compliance, the Proposed Design EDR credit is limited to a PV size that nets out the site annual kWh; specifying a larger PV array will have minimal impact on improving the EDR score. However, for above code projects, the software will allow oversizing of the Part 6 PV system by a factor of 1.6 and still get full credit, if a battery system of at least six kWh is coupled with the PV system.

Bypassing the PV Size Limit – In some climate zones it may be difficult to reach full ZNE (EDR score of zero) with a PV system that is within the 1.6 sizing factor discussed above. For this reason, on the battery tab, the software includes a check box called "Allow Excess PV Generation EDR Credit for above code programs," which allows the user the bypass the 1.6 size limit. Once this box is checked, the user can enter any size PV and get full EDR credit for it. ***NOTE: Choosing this option may violate Net Energy Metering (NEM) sizing rules. If this option is chosen, the users are advised to contact the local utility to ensure compliance with the PV sizing rules.***

Target EDR:

The Target EDR tool may be used when a user has a specific EDR target in mind and wants to know what size PV is needed to reach that target EDR; the "Specify Target EDR Score" checkbox is displayed on the EDR/PV input tab. The software will calculate the required PV size based on the energy efficiency measures, demand flexibility features, and the specified target EDR. The resulting PV size is displayed on the top of the "Energy Use Detail" results tab.

Note that this feature must be used carefully and only when a PV size calculation is needed for a given EDR score; the box should remain unchecked at all other times. Leaving this box checked will increase the runtime and may result in anomalous results.

Some notes about this version:

1. Do not install this version over the top of your working versions of CBECC-Res 2016 or 2019. Use a different directory for the 2019 draft software.

2. It includes draft versions of all of the components needed to calculate 2019 performance compliance, including 2019 TDV factors and the draft 2019 standard design. One set of prototype files meeting the draft 2019 standards are included.

3. It will only perform 2019 calculations.

4. It cannot be used for compliance and will not produce a valid CF1R or XML file.

5. Input files generated in earlier 2016 and 2019 versions of CBECC-Res can be imported, but they must be converted immediately and saved as *.ribd19 files. The .ribd19 files cannot then be opened in earlier versions of CBECC-Res.

6. Calculations for additions and/or alteration projects (EAA) may run but will have faulty results.

7. Multiple orientation runs should be accurate as long as the PV system is modeled with the CFI box checked. Results for multiple orientation runs are not accurate when the Target EDR box is checked.