Quick Start Guide
CBECC-Res 2019.0.11 Alpha Version

January 28, 2019

Welcome to the CBECC-Res 2019 Alpha Version. This software is intended for users who want to be review the software as part of the approval process. Some of the features of this software include:

Prescriptive Requirements from Approved Language. Includes changes to IAQ rates.

Electric Standard Water Heating. Available in this version for systems serving individual dwelling units or multiple units if there is no recirculation system.

PV Scaling. Makes it easier to specify a PV system that meets compliance requirements.

Self Utilization Credit. Allows an efficiency credit for the installation of a battery.

Included with the software are a set of files for the 2700 ft^2 prototype home in climate zone 12 illustrating the new features of the software. There is also a full set of the prototype files for each climate zone for the 2100 ft^2, 2700 ft^2 and 6960 ft^2 prototypes.

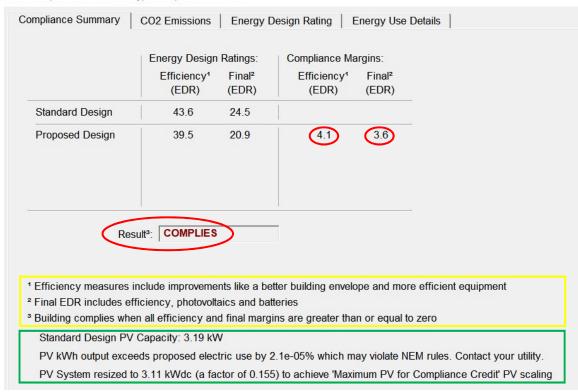*This version represents the draft 2019 software as of January 28, 2019 and results may change in future versions.*

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 embedded 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 proposed Final 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.

QSG_Compliance - 2019 Prototype Unequal Orientation

| Compliance Summary | CO2 Emissions | 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	43.6	24.5		
Proposed Design	39.5	20.9	4.1	3.6

Result[3]: **COMPLIES**

[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

Standard Design PV Capacity: 3.19 kW
PV kWh output exceeds proposed electric use by 2.1e-05% which may violate NEM rules. Contact your utility.
PV System resized to 3.11 kWdc (a factor of 0.155) to achieve 'Maximum PV for Compliance Credit' PV scaling

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 as highlighted in red. The text in the yellow box describes some key details about the ratings, and the text in green highlights details about the PV system used in the run. More details are shown in 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. PV and demand flexibility measures do not affect the Efficiency EDR. Precooling as a demand response measure is available in this release and demand response heat pump water heaters are under development. 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

CBECC-Res awards EDR credit for a battery storage system that is coupled with a PV array. The specified battery storage size must be 5 kWh or larger.

There are three control options available for batteries:

Basic. Battery charges whenever there is excess PV. Battery discharges to meet house load when PV does not cover it. Battery only meets house loads and does not put power into grid.

Time of Use. Battery charges whenever there is excess PV. During peak summer months (July-September) start discharging at the beginning of the peak period (that varies with climate zone)

at maximum rate until fully discharged. Other months run with basic control. Battery will put power into grid after meeting house load if discharge rate allows it.

Advanced DR Control. During peak summer months control knows that it is going to be a peak day and what the peak hours will be. On a peak day, use all PV to charge the battery until it is full. Discharge at maximum rate during highest TDV hours. Otherwise run with basic control. Battery will put power into grid after meeting house load if discharge rate allows it
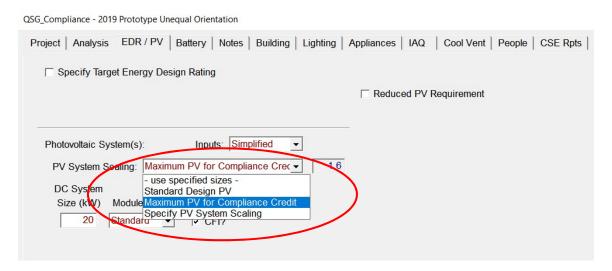
Self Utilization Credit

The software now has a checkbox that allows the user to get an efficiency credit for the installation of a battery.

PV Sizing Limit

For Part 6 compliance, the Proposed Design EDR credit is limited to a PV size that nets out the proposed site annual kWh when there is no battery. When there is a battery, the software will allow oversizing of the Part 6 PV system by a factor of 1.6, if a battery system of at least 5 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, users are advised to contact the local utility to ensure compliance with the PV sizing rules.*

To enable the software to calculate the proposed PV that matches the PV size limit without requiring the user to guess the answer and rerun the software, the software now supports inputs that allow PV scaling.

There are four scaling options:

Maximum PV for Compliance Credit. This is likely the most useful choice where the software sizes the PV to match the PV Size Limit described above. Without a battery, this size is equal to a system that generates the proposed site kWh. With a battery, this size is equal to a system that generates 1.6 times the proposed site kWh.

Use Specified Size. This input is useful when the size of the PV system has already been designed and has a known size.

Standard Design PV and Specify PV System Scaling. These are less useful scaling choices that were used in the design of the software. The Standard Design PV sets the PV size equal to the same size as the Standard Design PV. The Specify PV System Scaling allows the user to specify the scaling at a multiple of the proposed site kWh.
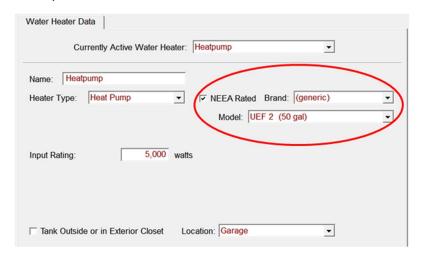
Target EDR

The Target EDR tool may be used when a user has a specific Final EDR target in mind and wants to know what size PV is needed to reach that 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.

Electric Standard Water Heating

When there is an electric or heat pump water heater in the proposed building, the Standard Design is now a generic heat pump water heater with a 2.0 UEF, basic compact distribution, and shower drain heat recovery dependent on the climate zone. When a building is all electric, the Standard Design is now all electric. This is available at this time for systems serving individual dwelling units or multiple units if there is no recirculation system.

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) have not been updated yet and are not available in this version.