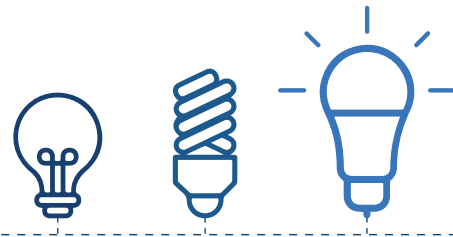


ENERGY DESIGN RATING



Energy Design Rating

The energy design rating (EDR) is a scoring metric that determines a building's compliance with the Building Energy Efficiency Standards (Energy Code). In the 2019 Energy Code, the EDR metric is only used with newly constructed low-rise residential buildings when demonstrating compliance using the performance approach. It does not apply to additions or alterations to low-rise residential buildings. Nor does it apply to nonresidential, high-rise residential, or hotel motel buildings.

The EDR Scale

EDR is a way to express the energy performance of a building using a scale of 0 to 100. A score of 100 represents the performance of the designed building if it were built to the 2006 International Energy Conservation Code (IECC). A score of zero represents a building that has zero-net-energy consumption based on the energy consumption of the proposed design.

The EDR Score

The EDR for newly constructed low-rise residential buildings has three components:

1. Efficiency EDR
2. Demand flexibility EDR including photovoltaic (PV)
3. Total EDR

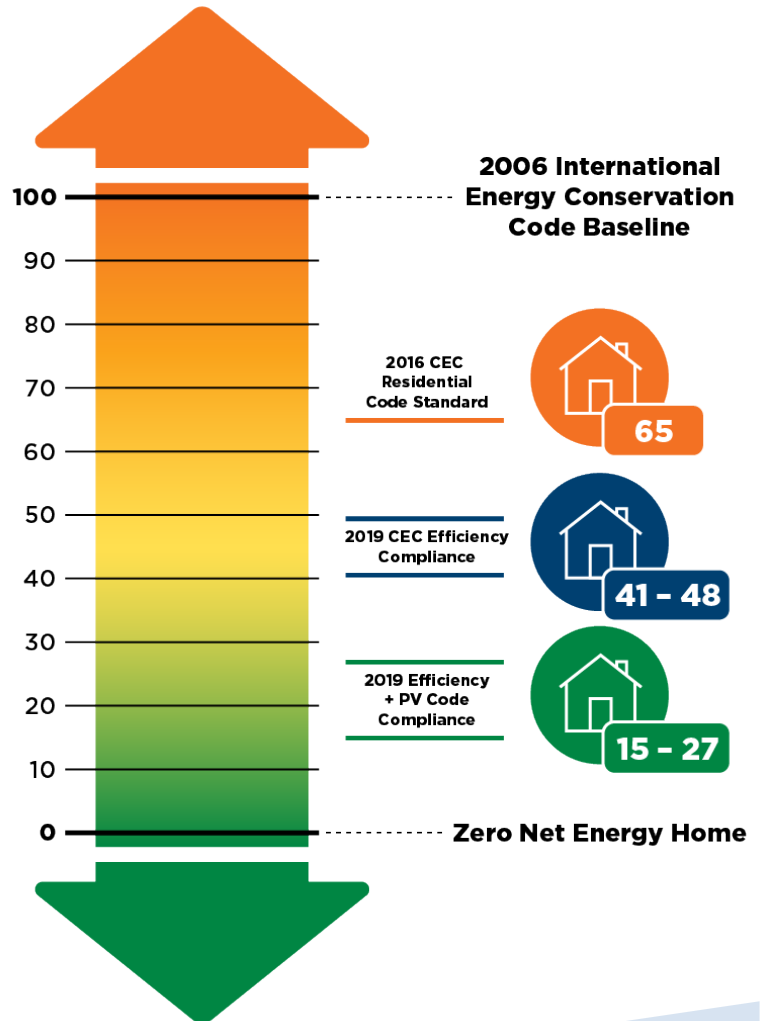
The efficiency EDR is based on the energy efficiency features of the building such as space heating, cooling, ventilation, and water heating.

The demand flexibility EDR includes the PV system, battery storage system, precooling, and other demand-responsive measures.

The total EDR combines the efficiency EDR with the demand flexibility EDR into one total score. The total EDR includes the effects of PV generation, battery storage, and demand response controls.

Demand Flexibility

Demand flexibility reduces energy consumption using communication and control technology to shift electricity use across hours of the day to decrease energy use on-peak or increase energy use off-peak. Demand responsive controls may be utilized for battery storage systems, HVAC, water heating, or other building systems. Demand response may occur on a range of timescales from seconds to seasons and represents any demand change in response to grid or economic needs.



EDR in the Energy Compliance Software

The compliance software allows flexibility of the proposed building's energy features to meet the requirements. The compliance software automatically calculates an energy budget for space conditioning, water heating, and the minimum required PV size based on a standard design building that meets the prescriptive requirements of the Energy Code.

To calculate the EDR, the user enters details of the proposed building with additional inputs for PV, battery storage, and other demand flexibility measures. The compliance software then calculates the proposed design energy use and the standard design energy use for the building type and fuel type. The efficiency EDR and the demand flexibility EDR score of the proposed design are provided separately so that the effects of both can be seen. The total EDR for the proposed building includes both the efficiency and demand flexibility EDR scores.

For a building to comply:

1. The efficiency EDR score of the proposed building must be equal to or less than the efficiency EDR score of the standard design building.
2. The total EDR score of the proposed building must be equal to or less than the total EDR score of the standard design building.

For more information on alternative calculation methods (ACM) using the compliance software, see the [2019 Residential ACM Reference Manual](#).

Both EDR Scores Need to be Met

The efficiency EDR and total EDR scores both must be met independently. If either of these scores exceed the standard design scores, the building does not comply with the Energy Code.

Can a Building Comply Without Meeting the PV System Requirements?

No. The building's total EDR score will not comply without a PV system, unless the building is exempt from the PV system requirements of the Energy Code. For more on the exceptions to the PV system requirement for low-rise residential buildings, see the [Solar PV Systems fact sheet](#).

Can Additional PV System Generation be Used to Increase Compliance with the Efficiency EDR Score?

No. The efficiency EDR score represents the building's overall efficiency without including energy generation. Increasing the PV system size will not affect the efficiency EDR score. However, when PV is coupled with a battery storage system, the energy modeling software allows a portion of the PV plus storage self-utilization credit to be traded against the efficiency EDR. In multifamily projects, a solar thermal flexibility credit for central heat pump water heating (HPWH) systems is allowed as a credit towards the efficiency EDR.

Meeting a Target Total EDR Score

The energy modeling software provides the option of a user specified target total EDR which will calculate the PV size. When this option is selected, the software calculates the required PV size based on the user defined inputs of the target total EDR, the size of the battery storage system, the battery control strategy, and the proposed annual kilowatt hour (kWh) budget of the building.

For more information on the Energy Code requirements, visit the [Online Resource Center](#).



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