

# 2019 Building Energy Efficiency Standards



Building  
Energy  
Efficiency  
Standards

**CALBO ABM**  
**Newport Beach, CA**  
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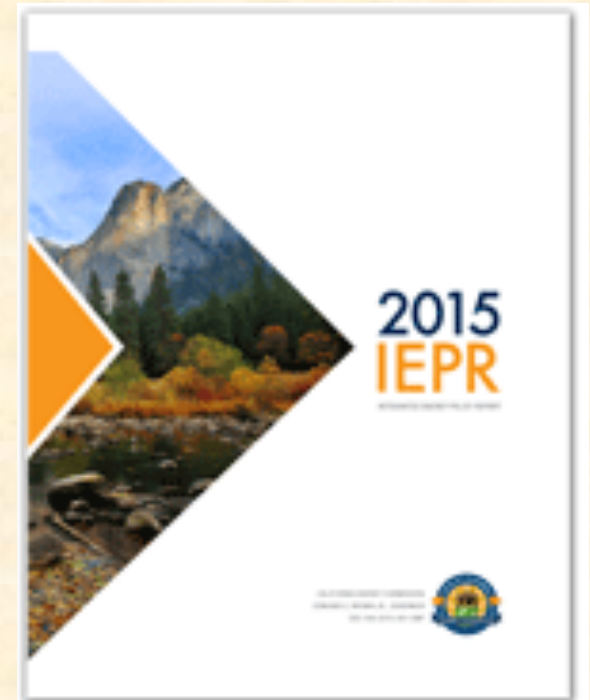
# ZNE Standards: the 2015 IPER Vision



A decade ago when the ZNE goal was first set it was a simple concept: All newly constructed residential buildings by the year 2020 should be ZNE as defined by the Integrated Energy Policy Report (IEPR):

“...the value of the **net amount of energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building**, at the level of a single “project” .... using the California Energy Commission’s **Time Dependent Valuation** metric.”

Improving building energy efficiency and deploying PVs were identified as the primary tools to achieve the ZNE goals



# ZNE Goals and Today's Grid



Reality turns out to be more nuanced - Since ZNE policy was first proposed, California has adopted policies to modify the electricity grid

- large scale PV deployment on the grid resulting from the **50% Renewable Portfolio Standard (RPS)**
- large scale deployment of **building-based PVs lowers the value of additional electricity** around midday, coincident with utility solar production
- Impacts of **net energy metering (NEM)** and **Time-Of-Use (TOU)** on compensation for residential customer-owned generation and cost effectiveness of PVs



# ZNE Goals will Impact the Grid



- The current NEM rules treat the grid as “**virtual storage**” (an energy bank), where excess generated kWhs can be “stored” and retrieved later in the day, or summer kWhs exchanged for kWh’s in the winter
- In reality, the **grid, as it is now, has little capability** to store and effectively use excess kWhs from distributed PVs



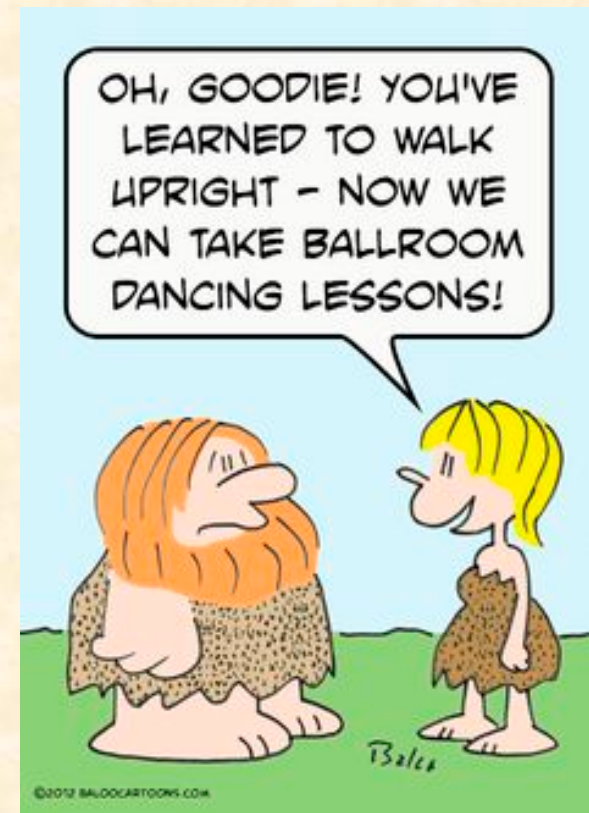
# ZNE Goals – Lessons Learned



The most important lesson is that within a few years, excess generation at midday will have less value

**Customer owned PV systems must be coupled with effective grid harmonization strategies (GHS), such as storage, demand flexibility, and EV integration to bring maximum benefits to the grid, the environment, and subsequently, the home owner.**

**Grid harmonization strategies are needed to maximize self-utilization of the PV array output and minimize uneconomic exports to the grid**



# ZNE Goals – 2019 Standards Goals



The 2019 Standards need to be structured to **send the right signals to the market** to pave the way for achieving full ZNE in future Standards by encouraging:

1. Envelope efficiency
2. Appropriately sized PVs
3. Grid harmonization strategies that maximize on-site utilization of PV output to limit exports to the grid



# PV Cost Effectiveness - Findings



All Standards measures , whether efficiency or renewables, must be cost effective in each Climate Zone, using life cycle costing

Using 2019 TDVs that capture the impact of 50% RPS by 2030, the Life cycle cost analysis shows:

**Appropriately sized PVs that displace kWhs used on site are found to be cost effective in all climate zones, even if future NEM2 rules are changed to lower exported kWh compensation rates – even without the Federal Investment Tax Credit (ITC)**



## Energy Design Rating (EDR) targets for each climate zone:

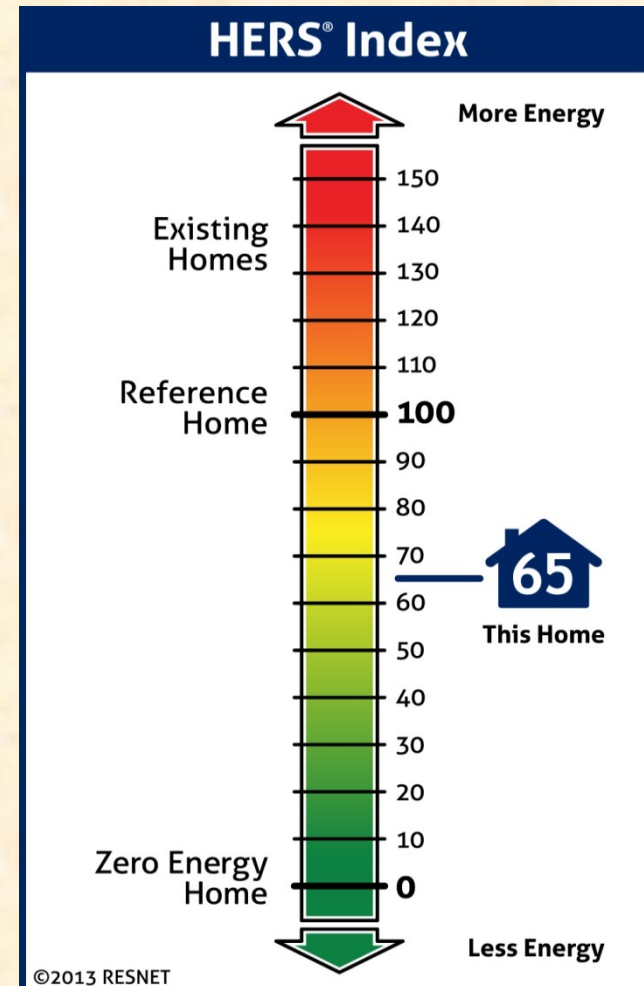
1. An EDR level for energy efficiency features based on 2019 prescriptive measures – This EDR target can only be met using energy efficiency measures
2. An EDR level for PV arrays that are sized to displace annual on-site kWhs
3. Combine the energy efficiency EDR with the PV EDR for one final target EDR
4. Compliance options to provide choices for meeting both the energy efficiency EDR and the PV EDR



# Builds on Commission's Energy Design Rating Tool



- Energy Design Rating (EDR) score show how close a home is to the ZNE target
  - Aligned with RESNET
  - Reference home is a 2006 IECC compliant home, EDR=100
  - A score of zero means the house is a ZNE building
- CBECC-Res software has the capability to calculate EDR scores for EE and PV
- Builders can use a combination of envelope energy efficiency features, better appliances, PVs, and other strategies to get to the target EDR



# 2019 BEES Schedule



2019 STANDARDS UPDATE SCHEDULE	
DATE	MILESTONES
August 2016 to April 2017	Stakeholder-hosted workshops & proposal development
January 2017-March 2017	Second round of Stakeholder-hosted workshops & proposal development
<b>April 2017</b>	<b>DRAFT Code proposals (CASE Reports) submitted to the CEC</b>
June 2017	Pre-rulemaking Draft Express Terms prepared, made available for public comment
<b>June 2017</b>	<b>FINAL Code proposals (CASE Reports) submitted to the CEC</b>
July 2017	Incorporate public comments into Draft Express Terms; prepare Notice of Proposed Action (NOPA) and Initial Statement of Reasons (ISOR)
September 2017	File Draft Express Terms, ISOR, NOPA with CBSC
November 2017	Draft Express Terms, ISOR, NOPA published; 45-day Public Review Period begins
November-December 2017	Host 45-day Language Hearings
January 2018	End of 45-day review/comment period; begin review of submitted comments and preparation of 15-day language
February 2018	Publish 15-day language; begin 15-day Public Review Period
May 2018	Adopt Final Express Terms of the 2019 Standards at Business Meeting
June 2018	Begin updating Software, Compliance Manuals, Electronic Documents
July/August 2018	CBSC Code Advisory Committee Meeting-CalGREEN
September/October 2018	Adoption CalGREEN (energy provisions) at Business Meeting
November 2018	Deliver Final Rulemaking Package to CBSC; Approve updates to Compliance Manuals
December 2018	CBSC Approval Hearing
January 2019	Make Software, Compliance Manuals, Electronic Documents Available to Industry
January 1, 2020	Effective Date of 2019 Building Energy Efficiency Standards (Title 24, Part 6)

# Informational Resources



- Energy Efficiency Standards approved computer compliance programs, CBECC-Res and CBECC-Com can be downloaded for free at:  
[http://www.energy.ca.gov/title24/2016standards/2016\\_computer\\_prog\\_list.html](http://www.energy.ca.gov/title24/2016standards/2016_computer_prog_list.html)
- Information on the current 2016 Building Energy Efficiency Standards, including Compliance Manuals, worksheets and additional resources can be found at: <http://www.energy.ca.gov/title24/2016standards/index.html>
- To receive documents and notification of upcoming events, please sign up on the List Serve for the 2019 Building Energy Efficiency Standards (Docket #2016-BSTD-06) at:  
<http://www.energy.ca.gov/title24/2019standards/prerulemaking/index.html>
- Title 24 Support Hotline: [Title24@energy.ca.gov](mailto:Title24@energy.ca.gov)