2019 Building Energy Efficiency Standards

CPUC En Banc on Customer Choice

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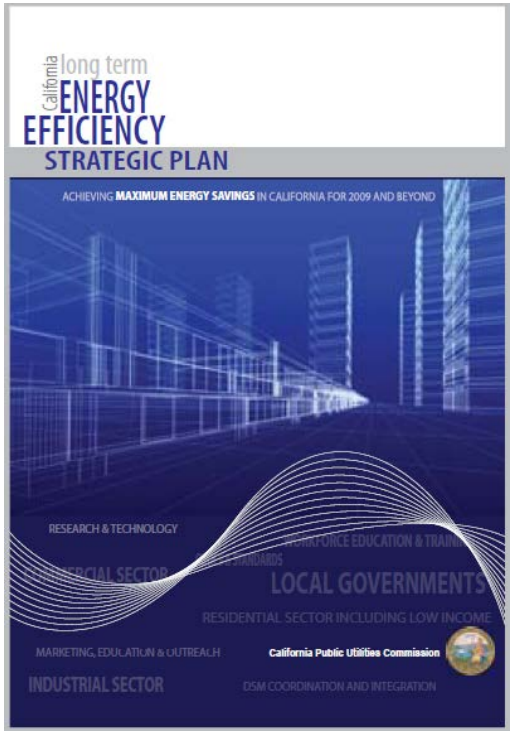
California Energy Commission

ZNE Strategy: The Vision

•The ZNE goal was a simple idea: All newly constructed residential buildings must be ZNE by 2020:

"…the **net amount of energy produced by on-site renewable energy resources is equal to the amount of energy consumed annually by the building**"

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



Progress Towards Reducing Carbon from Buildings

The 2019 Standards:

1. Incorporate efficiency measures and PV within the confines of cost effectiveness, NEM, and life cycle cost rules
2. Contribute to the State's GHG reduction goals
3. Promote self-utilization of the PV generation by encouraging or requiring demand flexibility and grid harmonization strategies
4. Provide independent compliance paths for both mixed-fuel and all-electric homes
5. Provide the tools for local governments to adopt ordinances that achieve additional reductions through Part 11 Reach Codes and other beyond code practices

2019 Standards Approach

The 2019 Standards recognize the following priority for efficiency and generation resources:

1. Envelope efficiency

2. Appropriately sized PVs

3. Grid harmonization strategies that maximize self-utilization of the PV output and limit exports to the grid

All-Electric Home Option

Standards allow an all-electric home's PV size to be the same as an equally sized mixed fuel home with similar features:

- A larger PV array can be installed but will not receive additional compliance credit
- Requiring a much larger PV system on an all-electric home to displace the larger annual kWh may discourage all-electric homes

Parallel Prescriptive Paths

There are two parallel prescriptive paths for compliance, one for each of:

1. Mixed fuel homes
2. All-electric homes

This allows the all-electric and mixed fuel homes to have their own prescriptive paths

NEEA Tier 3 HPWH models can easily be used to meet or exceed standard design using the performance path

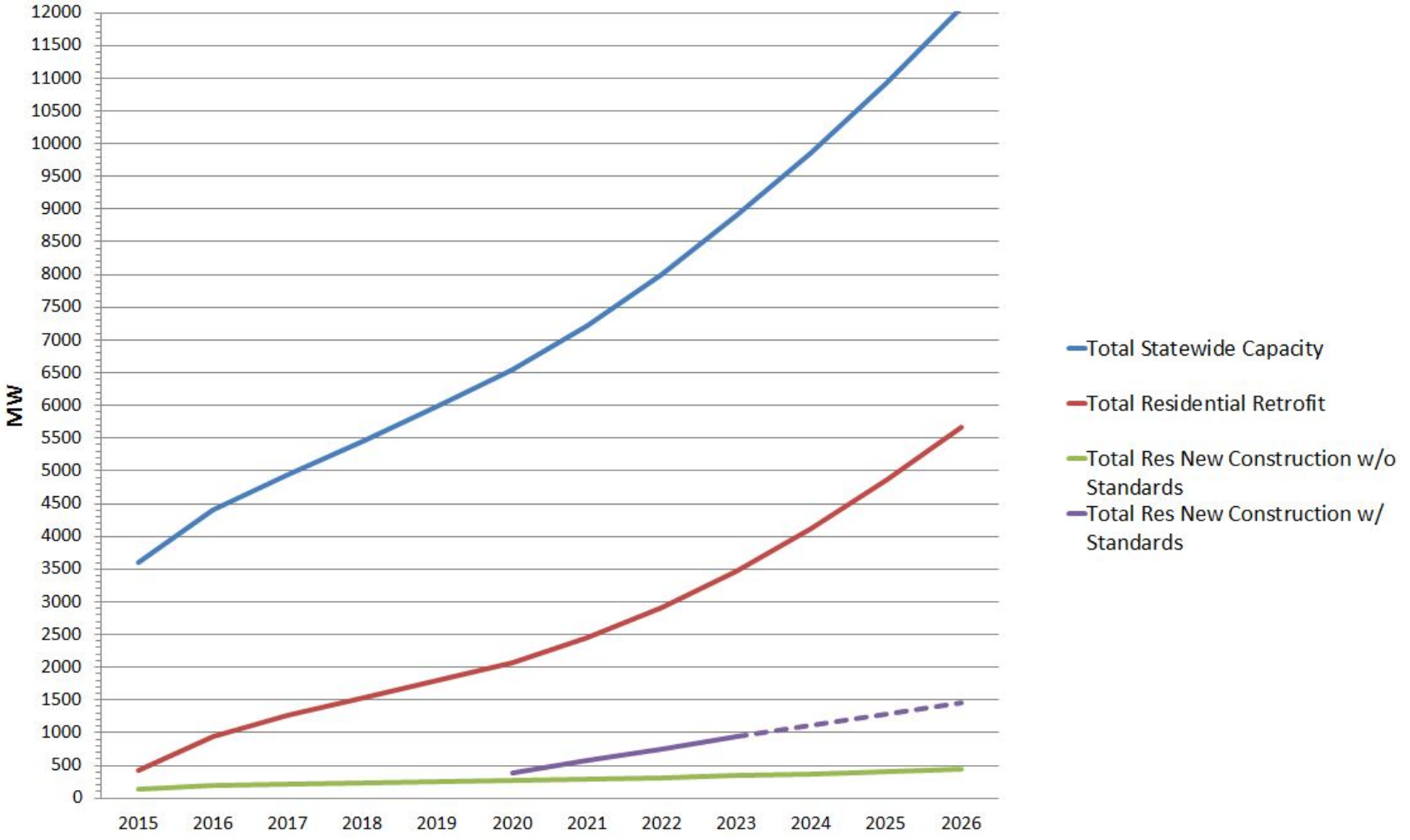
Compliance determined by Energy Design Rating

- A target EDR establishes a performance benchmark that the building must meet for compliance
- CBECC-Res software has the capability to calculate EDR scores for EE and PV separately
- Builders must incorporate a minimum level of envelope energy efficiency, better appliances, PVs, and other strategies to get to the target EDR
- Target EDR is fully compatible with reach codes. Local jurisdiction can simply identify a lower target EDR

Exceptions to Onsite PV Requirements

- Solar access blocked by shading barriers
- Reduced PV requirements for multi-story homes
- Poor solar orientation in plans approved before 2020
- Reduced PV requirement if installed in conjunction with a battery storage system
- Community Solar
- Commission determination that PVs not cost effective for specific buildings

Projected Impact of PV Requirement Compared to Other PV Development



Electrified Buildings Have Lowest CO2 Emission Levels

2019 Standards result in significant CO2 reduction in buildings

2700 sf prototype, CZ12		
CO2 Impact of Housing Choices		**Metric Tons of CO2 Emitted/yr**
Mixed Fuel	2000 Compliant Building, No PV	**6.5**
Mixed Fuel	2016 Compliant Building, No PV	**3.26**
Mixed Fuel	2019 Standard Design, with 3.1 kW PV	**2.29**
All-Elect	2019, 3.1 kW PV	**1.12**
All-Elect	2019, 6 kW PV	**0.46**

Next Steps

- California Building Standards Commission approval Fall 2018
- Effective date of standards January 1, 2020
- Ability to adopt local ordinances available now

Questions?

CBECC modeling tool for energy and GHG emissions available for download:

http://www.energy.ca.gov/title24/

California Energy Commission - energy.ca.gov

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