



# **California's Zero Net Energy Building Goals How Local Governments Can *Get Involved !***

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# California's ZNE Building Goals

- *All new residential construction and all new commercial construction in California will be zero net energy by 2020 and 2030, respectively*
- *50% of existing commercial buildings will be retrofit to ZNE by 2030*
- *All new state buildings and major renovations shall be ZNE (2025)*
  - *50% of existing state-owned building area by 2025 shall be ZNE*
- *IOUs shall launch and ramp a ZNE K-12 Schools and Community College Pilot Program in 2015-18*



DPR Construction San Diego Corporate Office , Chip Fox, DG&E, renovation



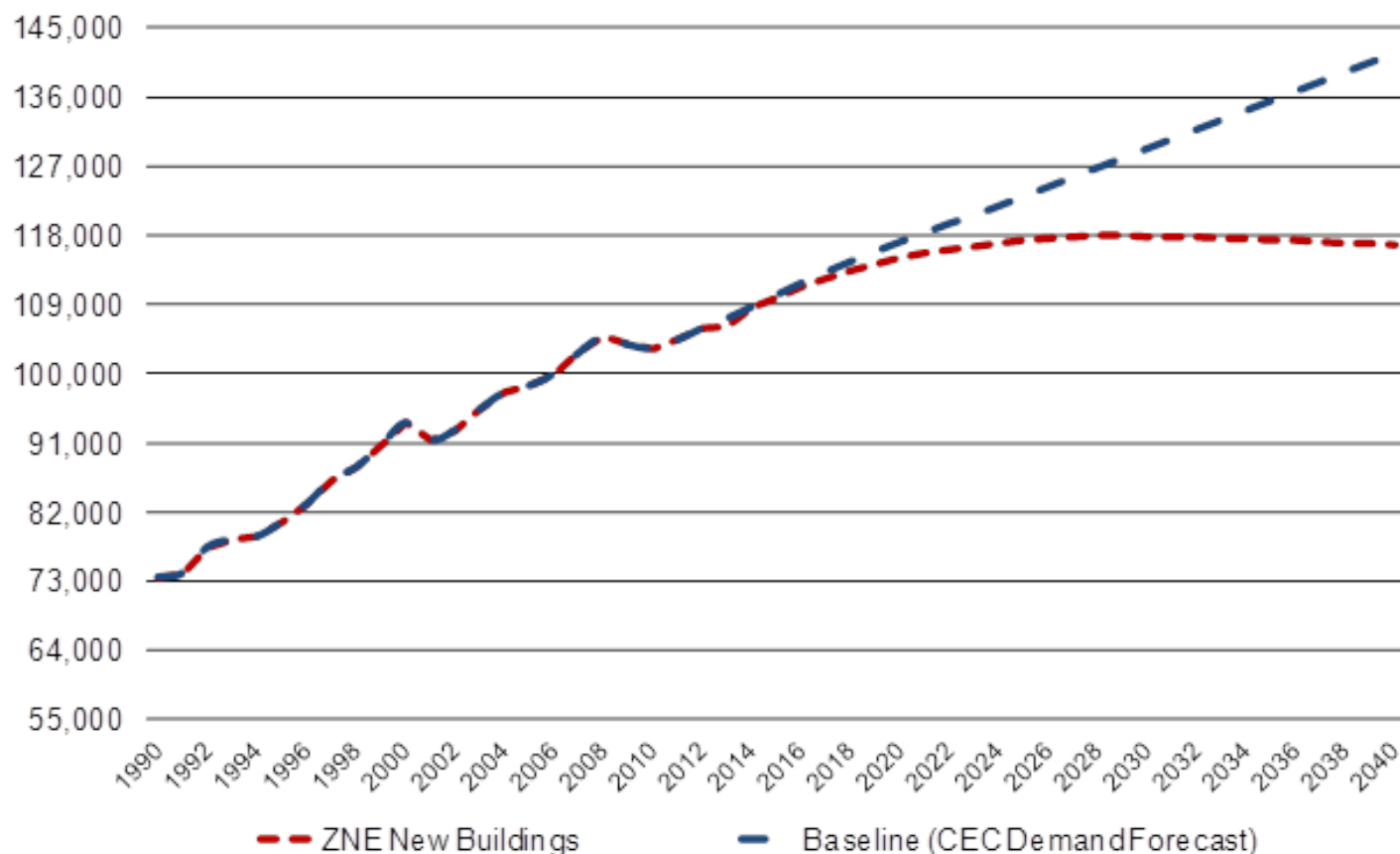
IBEW ZNE Center, San Leandro, renovation





# Energy Savings Potential Commercial ZNE Bldgs

Commercial Electricity Consumption with Efficiency Scenarios  
(GWH)



About  
seven  
500 MW  
power  
plants



Rough assessment: zero's out all load from all projected future new construction (2012)  
Res New Construction similarly projected to require some six new 500 MW power plants to meet load



Zero Net Energy Programs and Activities

# **RESIDENTIAL NEW CONSTRUCTION**







**Release date June 9, 2015**  
**Launch Workshop at the CPUC**

# CA | Energy Efficiency Strategic Plan

## **New Residential Zero Net Energy Action Plan 2014-2020**

*June 2015*



California Energy Commission  
Efficiency Division



California Public Utilities Commission  
Energy Division





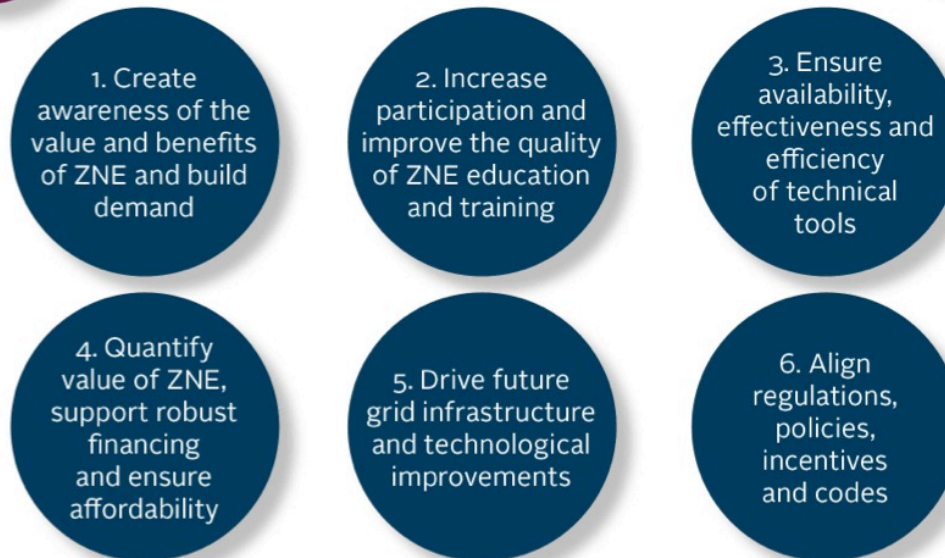
## VISION

**100% of all New Homes in California will be Zero Net Energy starting in 2020**

## GUIDING PRINCIPLES

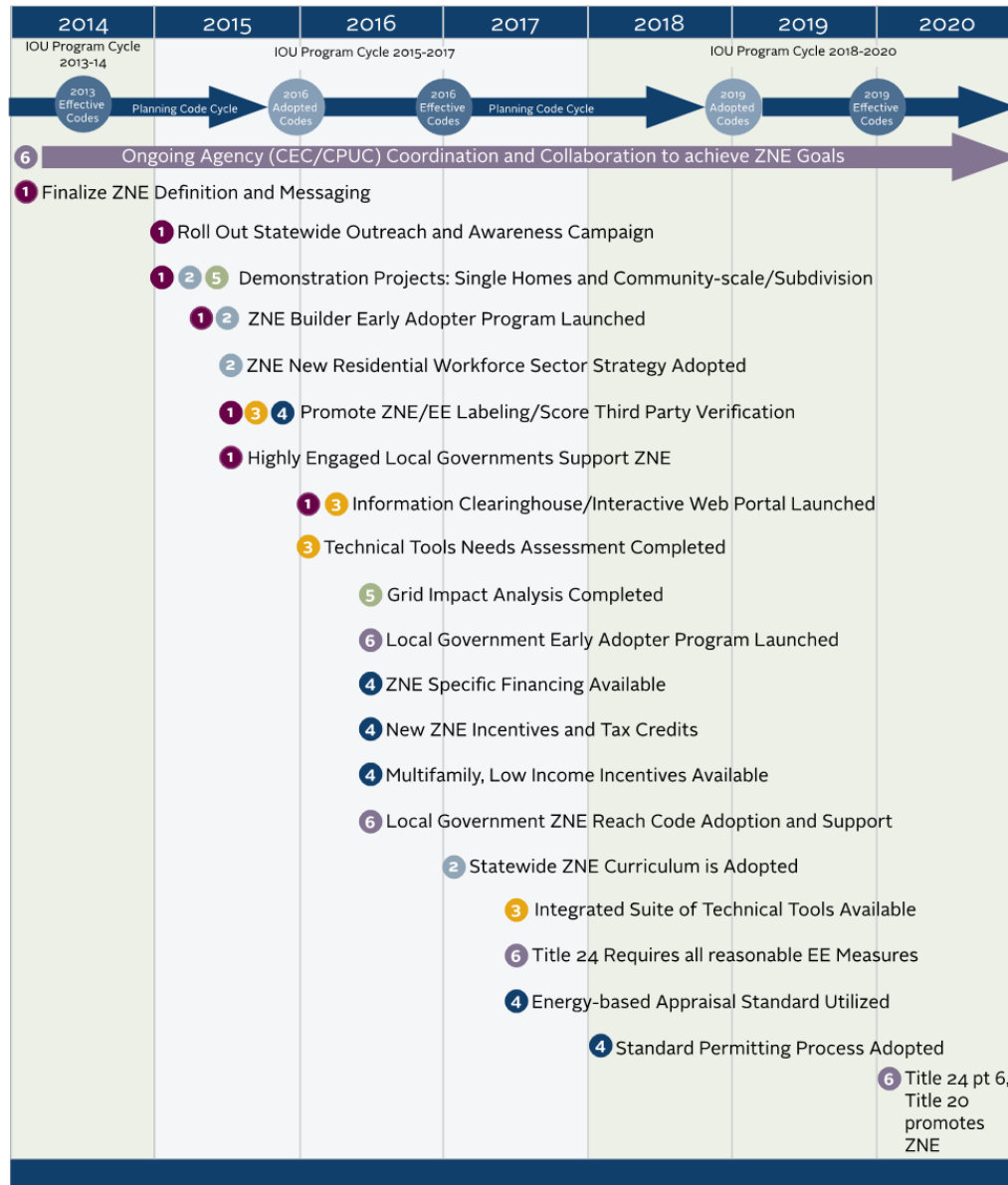


## ACTION PLAN GOALS





# Overall Critical Path



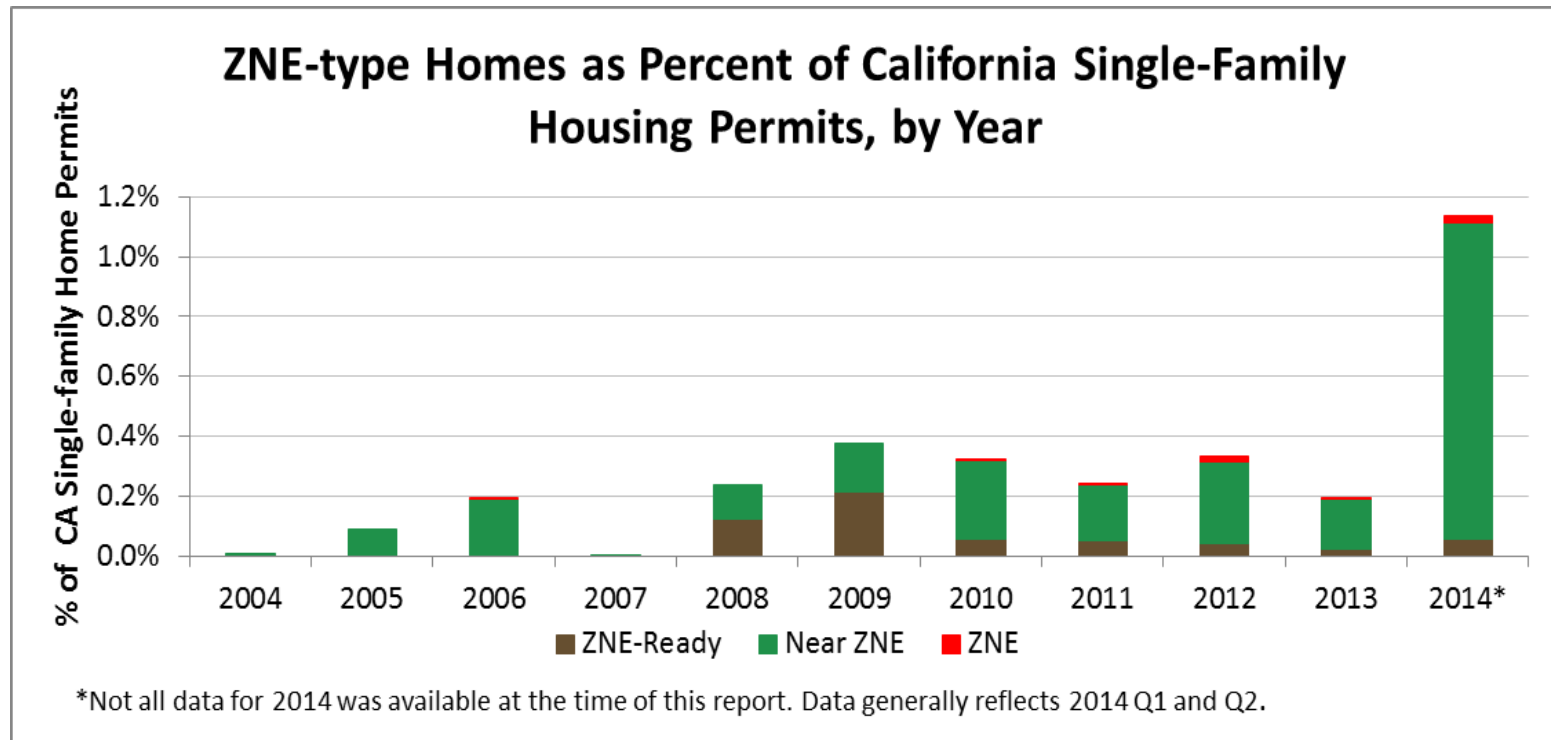


# What is Current ZNE Residential Home Market Size?

Approximately 1,100 ZNE-type homes

Mostly near ZNE, but includes 16 ZNE

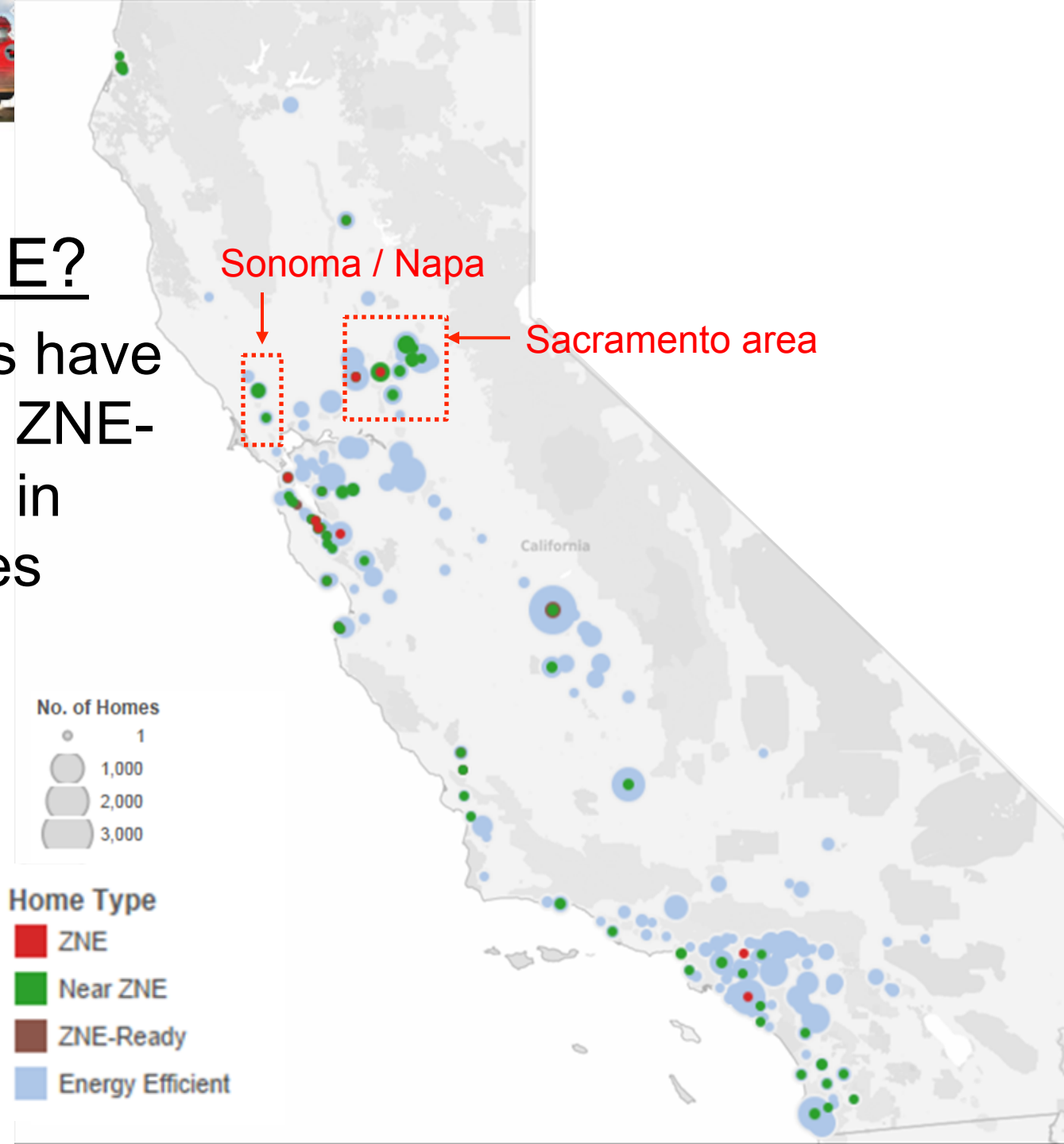
About 0.2-0.4% of market since 2006, but ~1% in 2014





## Who is pursuing ZNE?

- 50+ builders have constructed ZNE-type homes in 130 CA cities





# 2015 Code Readiness Initiative IOU Support

- ***High Performance Attics and Ducts in Conditioned Space:***  
*Get the ducts out of hot, hot space*
- ***High R-value Walls ( $\leq 0.050$  assembly U-Factor)***
- ***Dedicated design and construction assistance***
- ***Builder Commitment***
  - Post-occupancy monitoring
  - Case studies
- ***Financial Support***
  - Leverage CAHP incentives
  - Per project incentives ~ About \$15,000 per key measure
- ***Rollout***
  - 3 builders each, PG&E/ SCE by mid-2016; 25 lots/builder



We're here to help builders today for tomorrow's environment.







# IOU ZNE Pilot Projects



De Young ZNE Home, PG&E supported, Photo: Rob Hammon 2014



Honda House, PG&E Supported, Photo: Davis Energy Group (2014)



ABC Home, SCE supported. Photo: SCE



KB Home Zero House, SDG&E Supported. Photo: Ken Hilligoss



Zero Net Energy Programs and Activities

# **NON-RESIDENTIAL BUILDINGS**





# Zero Net Energy Buildings in California: Commercial Buildings

60 ZNE commercial buildings since 2007\*



DPR Construction San  
Diego Corporate Office ,  
Chip Fox



Bacon St. Offices,  
SDG&E & Hanna  
Gabriel Wells  
Architects



SMUD East Campus Operations Center, Doug Norwood

- Analysis performed by New Buildings Institute. Includes ZNE Ready and Near ZNE buildings. Not all verified.







## Zero Net Energy Buildings in California: SMUD- MF and Subdivisions



SMUD Energy Smart Community Project, with Pacific Housing and Sunverge Energy – zero peak, net zero, net zero carbon

Obadiah Bartholomy, SMUD



SMUD SolarSmart Program, Elliot Homes Subdivision, Mike Keese and Alex Araiza,





## Zero Net Energy Buildings in California:



Developed by Wakeland Housing with Energy Commission support, Global Green USA, Walker Wells





# Prop. 39 K-12 Schools and Community College Initiative

## ◆ Five Elements to the Pilot- *Target of 13-18 demo buildings*

|                   |                                               |
|-------------------|-----------------------------------------------|
| <b>Element 1:</b> | <b>IOU ZNE Demonstration School Retrofits</b> |
| <b>Element 2:</b> | <b>Training Outreach and Recognition</b>      |
| <b>Element 3:</b> | <b>Institutional Training</b>                 |
| <b>Element 4:</b> | <b>Codes and Standards</b>                    |
| <b>Element 5:</b> | <b>Production Program Development</b>         |

### **The ZNE Pilot will provide:**

- Design assistance
- Trainings on how to socialize the ZNE concept with stakeholders (e.g. parents, teachers, students, board members)
- Ongoing commissioning and construction inspection
- Training on how to maintain ZNE operations
- Monitoring, verification

### **And the ZNE Pilot will require:**

- Written commitment to the Pilot
- A willingness to design and retrofit a ZNE building
- A healthy budget
- A willingness to share experiences with other interested schools





# Number of Demonstration Projects



### Per Utility (Under development):

|                  |              |
|------------------|--------------|
| PG&E             | 5-7          |
| SCE/SoCalGas     | 5-7          |
| <u>SDG&amp;E</u> | <u>3-4</u>   |
| <b>Total</b>     | <b>13-18</b> |

### Per School Type:

|              |              |
|--------------|--------------|
| CCC          | 3-5          |
| K-12         | 10-13        |
| <b>Total</b> | <b>13-18</b> |





# Supporting Early Adopters

## 5 GREAT NEW TOOLS FOR ZNE BUILDINGS

**1 ZNE Message Platform**  
Key messages for target audiences on the what and why of ZNE.

**2 "Intro to ZNE" Presentation**  
Customizable powerpoint presentation provides an overview of California's goals and policies for ZNE, key strategies, and case study examples.

**3 ZNE Companion Guide/Fact Sheets**  
Collection of FAQs, resources, design strategies, and key messages for designers, commercial building owners, policymakers, and decisionmakers of schools and public buildings.

**4 Case Studies: ZNE & Ultra-Low Energy Buildings**  
Read about ZNE and ultra-low energy building examples, including design strategies, costs, and lessons learned.

**5 ZNE Action Bulletin**  
Sign up for our quarterly e-newsletter for updates on ZNE news, events, trainings, case studies, planning, policy, and research. To sign up, or to get more info about the toolkit, email [heather@newbuilding.org](mailto:heather@newbuilding.org).

## ZNE Communications Toolkit



### ZNE Companion Guide to Zero Net Energy in CA

TOOLS & RESOURCES FOR DECISIONMAKERS, DESIGNERS, OWNERS, POLICYMAKERS, & CHAMPIONS

JUNE 2013 DRAFT



zero net energy

Frequently Asked Questions, Design Fundamentals, Project Profiles, & Resources for More Information

energy upgrade  
CALIFORNIA



### ZNE ACTION BULLETIN

Progress Towards Zero Net Energy Buildings



[www.newbuildings.org/zne-communications-toolkit](http://www.newbuildings.org/zne-communications-toolkit)





# ZNE Early Adopters Leadership Trainings

## ZNE Trainings



## Planning Tools



## ZNE Tours



## Peer Learning



Support for Schools, Local Governments, Higher Ed & State Agencies





Zero Net Energy Programs and Activities

# MOVING FORWARD TO ZNE





# Distribution Planning and ZNE Bldgs

- ***Distribution Resource Planning Proceeding (R. 14-08-013)***
  - Integration capacity Analysis
  - Optimal locational benefit analysis
  - Distributed Energy Resources growth scenarios
    1. Trajectory
    2. High Growth
    3. Very high potential growth, including ZNE Title 24
- ***CPUC Customer Distributed Energy Resources Grid Integration Study***
- ***CPUC Study of Compliance Options for Offsite or Community Renewables and ZNE***
- ***CPUC will adopt NEM successor tariff by end of 2015*** (R.14-07-002)





# Advancing California's ZNE Goals: What Can Local Governments Do?

Recommendations from Center for Sustainable Energy report: *"ZNE Buildings: How California's Local Jurisdictions can Lead the Way."*

- Officially adopt ZNE goals
- Create a ZNE Task Force
- Enact "reach codes" or local ordinances exceeding Title 24, Part 6
- Transform municipal buildings into ZNE buildings
  - Libraries, **Schools**, Municipal Buildings
- Streamline permitting and interconnection for EE and renewables
- Establish benchmarking and disclosure policies
- Incentivize construction that exceeds Title 24, Part 6
- Enact PACE or other financing program(s) for commercial buildings
- Provide ZNE education and outreach to industry stakeholders
- Focus on building code training and compliance
- Partner to Create ZNE Pilots at Community or Sub-division Level







# Thank you!

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<http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Zero+Net+Energy+Buildings.htm>

<http://www.californiaznehomes.com>

