



Local Governments and California's Zero Net Energy Buildings Goals

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How Can Local Governments Get Involved?

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energy
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CALIFORNIA

Local Governments and Zero Net Energy Buildings

- California's ZNE Building Goals
- Defining ZNE- What is it?
- How Local Governments can help Advance CA's ZNE Goals



IBEW Zero Net Energy Center, San Leandro



Local Governments and Zero Net Energy Buildings

PART 1: CALIFORNIA'S ZNE BUILDING GOALS

Big Bold Goals- Adopted 2007-08 by Energy, Utilities Commissions

- All new residential construction in California will be zero net energy by 2020
- All new commercial construction in California will be zero net energy by 2030
 - 50% of existing commercial buildings will be retrofit to ZNE by 2030



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



One Sky Homes Cottle House in San Jose, Allen Gilliland

State Buildings ZNE goals-

Adopted by Executive Order in 2012

- All new state buildings and major renovations starting design in 2025 shall be ZNE; 50% at 2020
- State agencies shall strive towards ZNE for 50% of existing state-owned building area by 2025.
- ARB 2014 Scoping Plan Update:
Consider Zero Carbon
Building Pathways (2017)



Why ZNE Buildings?

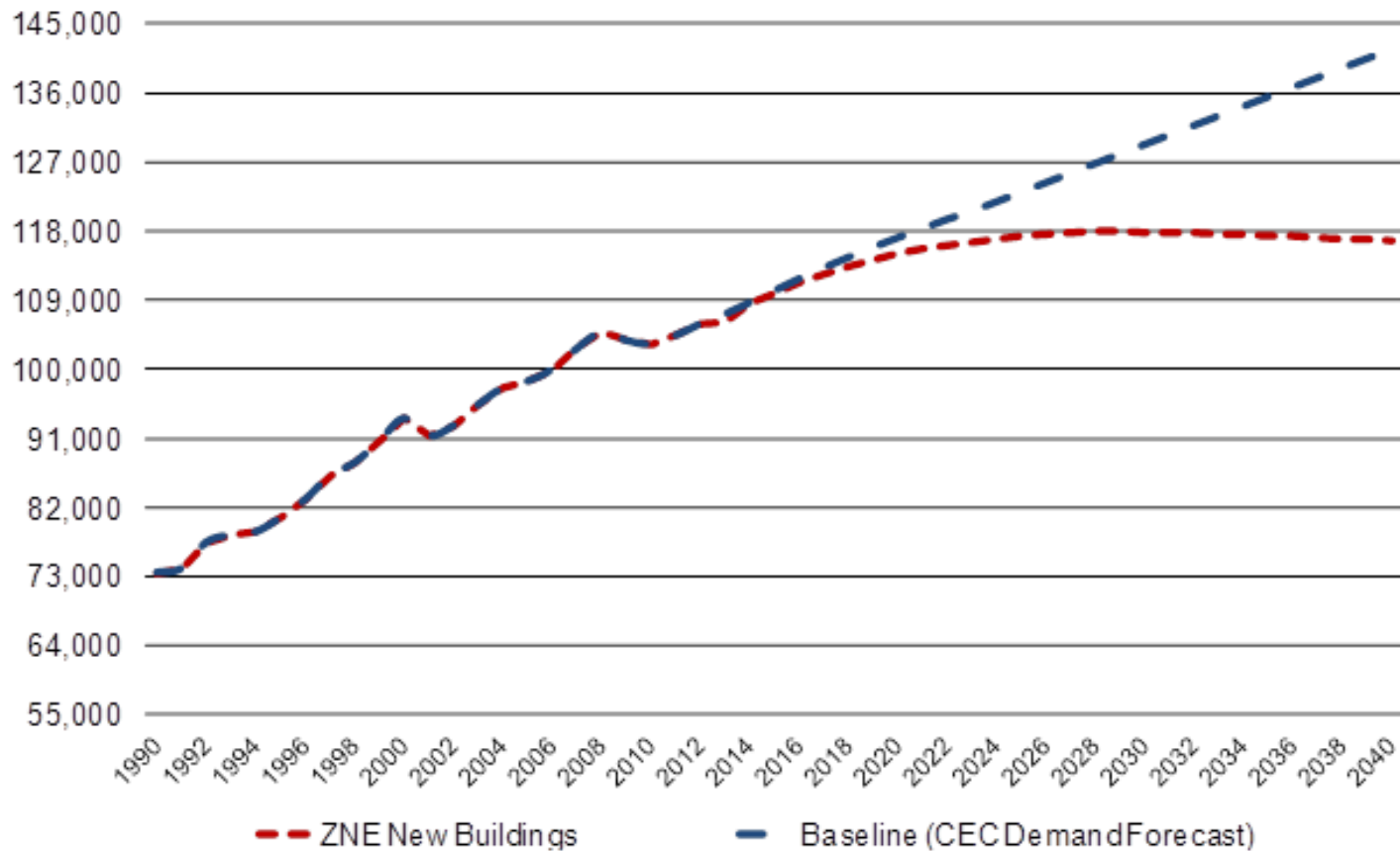
- Maximum long term energy savings
- Transform the market
- Incorporate gains into building code
- Ensure buildings are smart and efficient
- Re-engineer EE programs
- Achieve CA's GHG reduction goals



2010 Groundbreaking of IBEW Zero Net Energy Center, San Leandro

Energy Savings Potential Commercial ZNE Bldgs

Commercial Electricity Consumption with Efficiency Scenarios
(GWH)



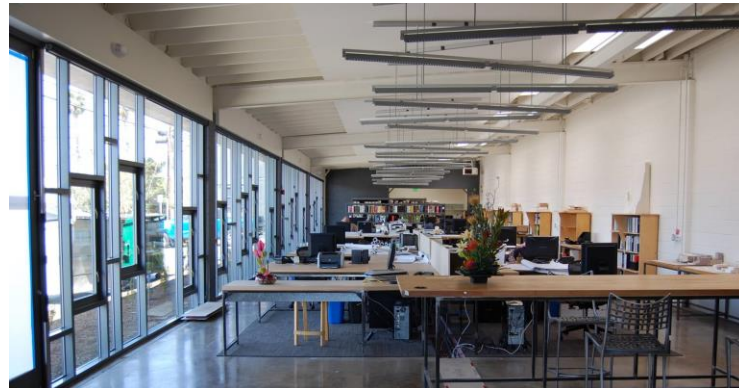
Zero Net Energy Buildings in California:

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

Zero Net Energy Buildings in California: Commercial Buildings

- Wide variety of building types and climate zones
 - Office & education
 - Multifamily
 - Military & public



David and Lucille Packard Foundation, Los Altos, CA



Chartwell School | Seaside, CA

Zero Net Energy Buildings in California: Costs

- CA commercial ZNE buildings show little / no incremental cost*
 - Res ZNE buildings \$2 - \$8 /ft² inc cost, EE only



Exploratorium | San Francisco, CA



IDeAsZ² Office Building San Jose, CA

Zero Net Energy Buildings in California: Residential- DeYoung Properties

- Uses 64% less energy than Title 24 (2008)
- 18% IMC
- \$1,700 annual bill savings



Zero Net Energy Buildings in California: Residential-Cottle House

- Produces 118% of home's energy consumption
- 87% including EV charging



Source: Alea German, Davis Energy Group

- Electric vehicle charging & plug loads contribute > 50% of total energy

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: Los Vecinos Affordable Housing, Chula Vista



Zero Net Energy Buildings in California: Residential- Irvine Smart Grid Demo Tract Home Retrofit Project



Zero Net Energy Buildings in California

Residential- ABC Greenhome (SCE)



Local Governments and Zero Net Energy Buildings

PART 2: DEFINING ZERO NET ENERGY- WHAT IS IT?

2013 IEPR ZNE Building Definition

*“A ZNE Code Building is one where the **net of the 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” seeking development entitlements and building code permits, measured using the California Energy Commission’s Time Dependent Valuation (TDV) metric. **A ZNE Code Building meets an Energy Use Intensity value** designated in the Building Energy Efficiency Standards by building type and climate zone that reflects best practices for highly efficient buildings.” (IEPR 2013).*

In other words... **A ZNE (Code) Building**

Accomplishes deep Energy Efficiency (and DR) first

Then produces as much onsite renewable energy in the course of a year as it consumes (measured using TDV).

Can go beyond this! Net Positive, Site Energy, Zero Carbon, etc.

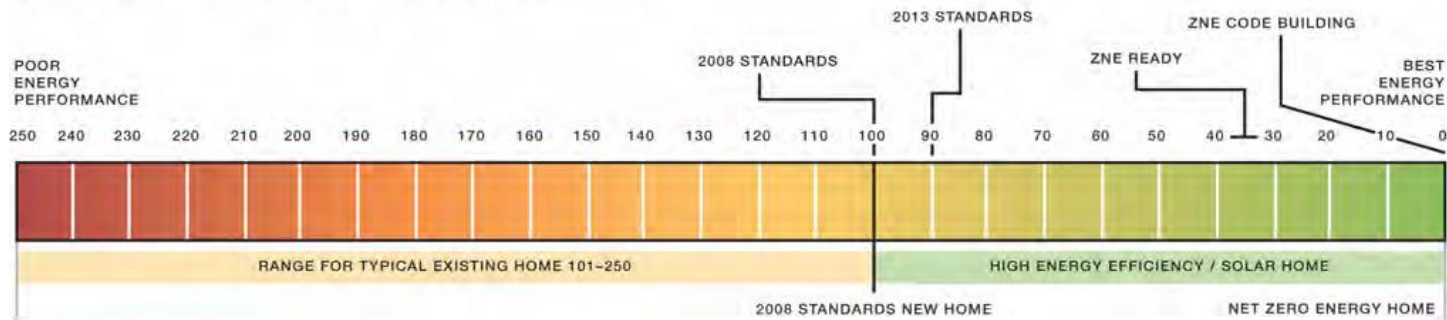
Does not imply zero utility costs

ZNE Code: ZNE Ready as Basis?

Include Off-site Renewables? (IEPR 2013)

- Recognizes that full onsite renewables for ZNE infeasible in some situations
 - Need for meaningful flexibility and specific exceptions
 - Need for development entitlements for off-site renewable energy resources
 - Must be enforceable by applicable enforcement agency and enable tracking and matching to specific buildings claiming offset

CALIFORNIA HOME ENERGY RATING CERTIFICATE



ZNE Communities- What's an Ecodistrict?

- What's an EcoDistrict?
 - A new model of public-private partnership that emphasizes innovation and deployment of district-scale best practices to create the neighborhoods of the future - resilient, vibrant, resource efficient and just
 - The fastest way to create the neighborhoods of the future: resilient, healthy, prosperous, and just. Places where people love to live, work, play, and learn.
 - A framework to advance Zero Net Energy Building Goals
- Leading cities:
 - Los Angeles, San Francisco, Washington D.C., Seattle, Austin, Boston, Portland

Local Governments and Zero Net Energy Buildings

PART 3: HOW LOCAL GOVERNMENTS CAN HELP ADVANCE CALIFORNIA'S ZNE GOALS

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

- Focus on building code training and compliance
- Adopt Reach Codes (and/or solar requirements)
- Be an Early Adopter: Build or Retrofit Public Buildings to ZNE Levels
 - Libraries, Schools, Municipal Buildings
- Partner to Create ZNE Pilots at Community or Sub-division Level
- Consider Becoming an EcoDistrict
 - Downtown area?
 - Corporate or Academic campus?

Thank you!

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California Public Utilities Commission -
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CPUC ZNE Buildings Website

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

ZNE Residential Action Plan Website

www.CaliforniaZNEhomes.com

