Zero Net Energy in CA

Introduction to ZNE
Zero Net Energy – What is it?

A ZNE building produces as much energy as it consumes through clean, renewable resources over the course of a year. Also known as Net Zero Energy.
Why ZNE?

- Optimized building performance
- Lower net energy costs and higher resale value
- Highest architectural, mechanical, and environmental leadership
- Comfortable and productive environment for working, learning and living
- Makes communities stronger, resilient and energy independent
“Big Bold” Goals for ZNE in California

1. All new commercial construction will be ZNE by 2030

2. 50% of existing buildings will be retrofit to ZNE by 2030

3. All new residential construction in California will be ZNE by 2020

The California Efficiency Strategic Plan (Sep 2008) californiaenergyefficiency.com/docs/EEStrategicPlan.pdf

Exploratorium | San Francisco, CA
Why is California pursuing ZNE?

California has established leadership in efficiency and clean energy for decades.

Talent and expertise among California’s workforce to implement zero net energy solutions and advance buildings to the best performance levels.

“The state and nation must be aggressive about setting goals, such as having zero-net-energy residential buildings by 2020 and commercial buildings by 2030.”

--California Governor Jerry Brown
## Foundation of State Policies

<table>
<thead>
<tr>
<th>Policy</th>
<th>Description</th>
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<tbody>
<tr>
<td>AB 32</td>
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<tr>
<td>Energy Efficiency Program for Existing Buildings (2009)</td>
<td>Requires the Energy Commission to develop and implement a comprehensive program to achieve greater energy savings in the state of California’s existing residential and nonresidential building stock.</td>
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<td>AB 758</td>
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<tr>
<td>Long Term Energy Efficiency Strategic Plan (2008)</td>
<td>State’s first integrated framework—a single roadmap to achieve maximum energy savings across all major groups and sectors.</td>
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Leading by Example  
California’s Policy for Public Buildings

Executive Order B-18-12 requires state buildings to significantly reduce over the next two decades.

- Any proposed new or major renovation of State buildings larger than 10,000 square feet use clean, on-site power generation, such as solar photovoltaic, solar thermal and wind power generation, and clean back-up power supplies.

- 50% of new facilities beginning design after 2020 to be Zero Net Energy.

- 100% of new State buildings & major renovations beginning design after 2025 to be ZNE.
Meeting California’s ZNE Goals

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Why Should Building Owners Go ZNE?

Reduced costs

When committing to a high efficiency building, ZNE is a great business decision and adds value.

- **Reduce** operating and equipment replacement costs.
- **Leverage** higher rent/lease and promotional value.
- **Decrease** tenant and employee turnover through more comfortable, healthy and productive spaces to live and work.
Getting to ZNE

1. INTEGRATED PROCESS
Addressing systems through integrated design.

2. TECHNOLOGIES

Daylighting  Heat Recovery
Lighting     Cool Roof
Hi R-value Glazing  Radiant
Natural Ventilation  Ground Source Heat Pump
HVAC         Underfloor Air Distribution
Renewable Energy  /Displacement

DESIGN STRATEGIES

Efficient Envelope: maximum insulation, super efficient windows, etc.

Best performing HVAC & water heating systems. Efficient lighting & lighting controls and appliances.

Monitor and control power consumption
Use sunlight to illuminate the building
Install onsite renewables

Chartwell School | Seaside, CA
Leading by Example

Bacon St. Offices

- Former auto-repair shop turned architect's office
- 1st in San Diego to achieve ZNE usage.
- Monitoring system tracks the actual use of building systems, and ‘real world’ data for educating others
- All electrical systems designed to reduce energy loads by over 42,000 kWh per year
- Remaining energy is offset by renewable electrical and water heating energy located on the roof top
Leading by Example
Packard Foundation

LEED PLATINUM
49,000 SQUARE FEET
ZNE PERFORMANCE

- Two daylit office wings with blinds and shades to control solar heat gain and glare
- Rainwater collected for toilet flushing, irrigation; stormwater is retained on-site.
- 95% of construction waste recycled/salvaged

David and Lucille Packard Foundation | Los Altos, CA

- Energy use reduced by 65% through integrated building design and aggressive reductions in plug loads
- Innovative use of roof-mounted photovoltaic panels will offset any energy used
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.

   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.

www.newbuildings.org/zne-communications-toolkit
What you can do today to get started

1. Develop your ZNE Plan
2. Create the supporting policy
3. Get & Use the ZNE Communication Tools & Planning Workbook
4. Build capacity through education, collaboration, and convening
Thank You!