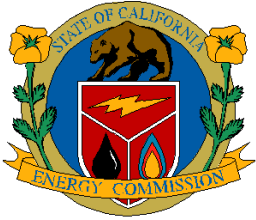




# CALIFORNIA'S ZERO ENERGY NEW HOMES PROGRAM

February 1, 2006  
California PV Utility Program Managers Meeting

**Ann Peterson, PIER Buildings Program Manager**



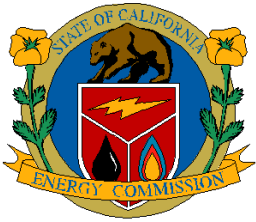
## *Purpose of ZENH Program*



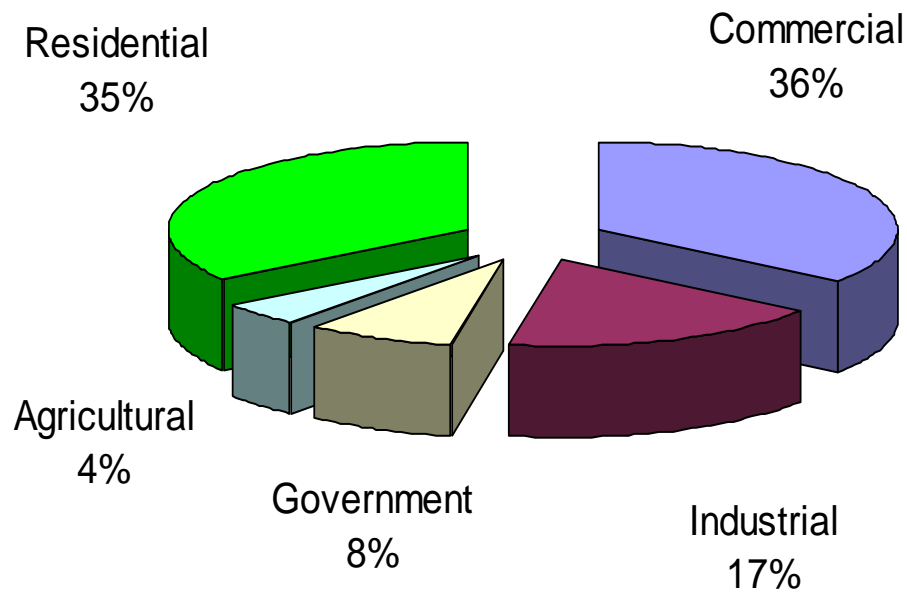
### Zero Energy New Homes: ZENH

- ❖ An approach to reduce energy use and peak demand in the residential sector using more cost effective energy efficiency and PV strategies

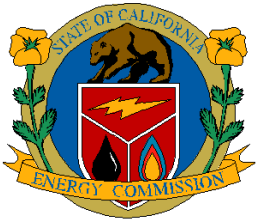
*Why focus on the residential sector and on new homes?*



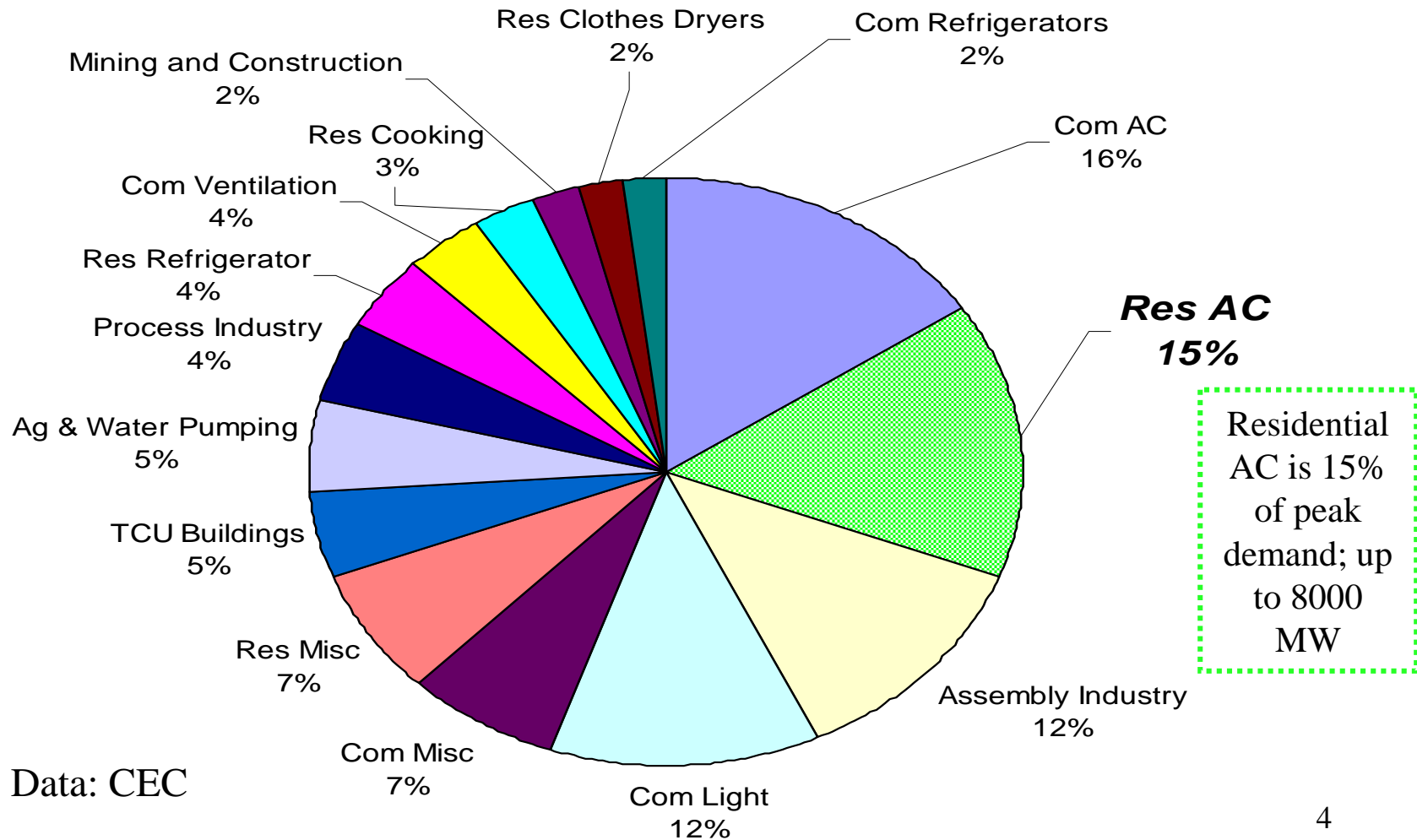
# *Residential Sector Represents 35% of Peak Demand ...*



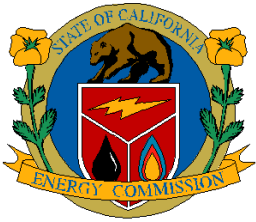
2001 Data: CEC



# ... and Residential AC itself is 15% of Peak Demand



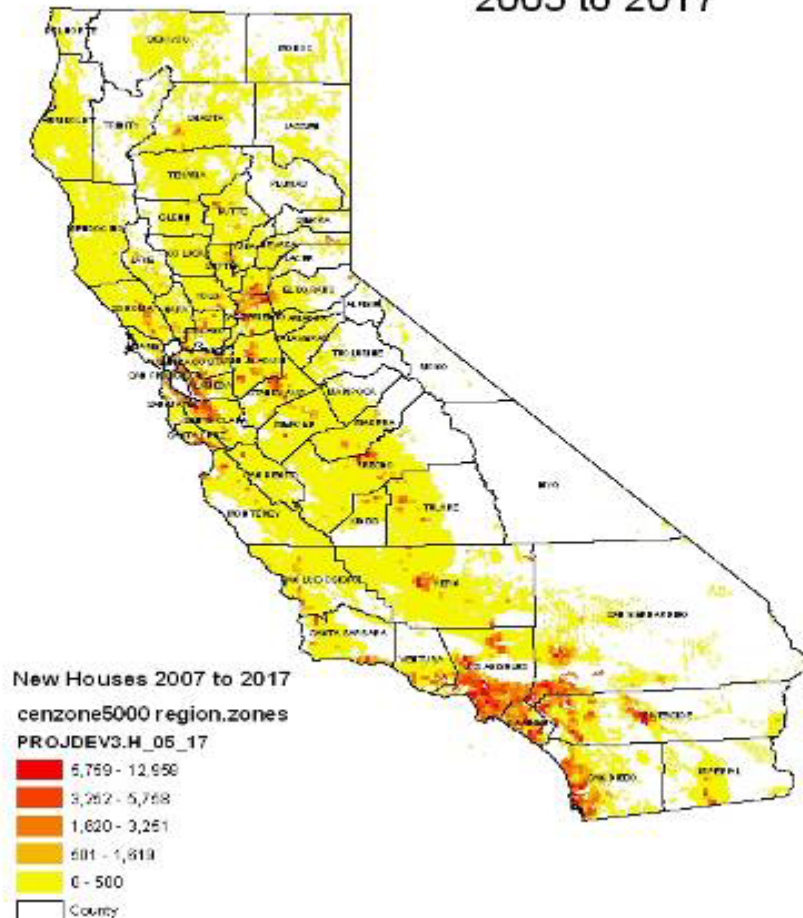
2001 Data: CEC



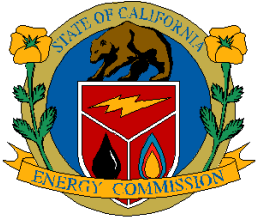
# *New Homes Will Continue to Increase Peak Demand*



Housing Growth  
2005 to 2017



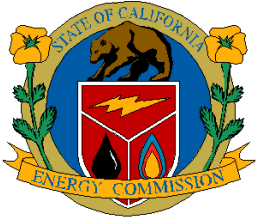
- ❖ At 100,000 new homes per year, CA will add over 1.2 million new homes by 2017
- ❖ AC loads from these new homes will represent an additional demand of over 2400 MW of peak capacity by 2017
- ❖ A majority of new homes will be located in hot inland regions where AC loads will be higher than average, and in areas facing electricity congestion or capacity issues



# PIER ZENH Program Overall Approach



1. **Develop ZENH designs** that optimize energy efficiency and on-site PV electricity generation
2. **Execute innovative business models** to reduce the incremental cost of a ZENH to the homeowner
3. **Pilot ZENH designs and innovative business models** in at least one 75+ unit development
4. **Monitor and validate performance** relative to goals
5. **Initiate actions to ensure long-term sustainability** of ZENH in CA



# PIER ZENH Program Performance Targets



## ❖ Energy Goal

- Improve building energy performance by 25% over Title 24

## ❖ Peak Goal

- Reduce peak demand to no more than 1 kW

## ❖ Cost Goal

- Reduce the incremental cost to the homeowner of a ZENH to \$5,000 or less
- Reduce electricity bill by 70%

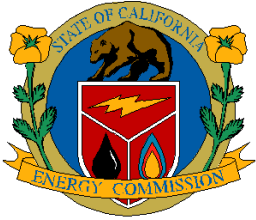


# Reducing Energy Use



## Goal 1: Improve building energy performance by 25% over California's Title 24

- ❖ Measured against 2005 Title 24 Standards
- ❖ This will require the use of programs that have been upgraded to comply with the 2005 Residential ACM Manual (using the Commission's Time dependent valuation (TDV) approach)



# Reducing Peak Load Impacts



## Goal 2: Reduce Peak Load Impact to 1 kW

- ❖ Regardless of house size
- ❖ Typical new homes draws ~ 4+ kW of load during hot summer afternoons
- ❖ By combining improved energy efficiency with photovoltaics, we hope to reduce peak system impacts to 1 kW. This is the entire house load served by the utility during the peak

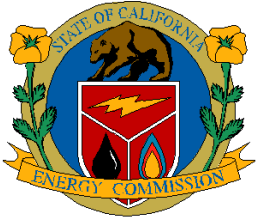


# Reducing Costs to Homeowners



## Goal 3: Reduce Electricity Bills by 70% and Limit Incremental Cost to Homeowner of \$5,000

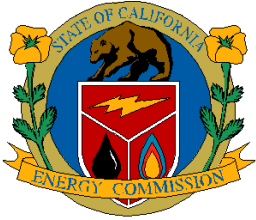
- ❖ Based on projected electricity bill (climate zone and house size)
- ❖ Anticipate Time of Use Rates and Net Metering to be employed
- ❖ Consideration of innovative strategies for implementation by utilities
- ❖ Cost goals are post rebates



## Awarded Contracts



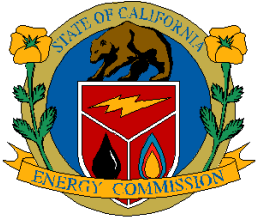
- ❖ Approximately \$10 M in PIER R&D Funds
- ❖ 3 contracts awarded in 2004 ZENH solicitation
  - **Utility Market Model for ZENH:** Architectural Energy Corporation (AEC)
  - **Commercializing ZENH Communities:** PowerLight Corporation
  - **Affordable Multifamily ZENH:** Global Green USA
- ❖ Expect to award additional contract in 2006
- ❖ Projects are expected to run through 2009



# Utility Market Model for ZENH



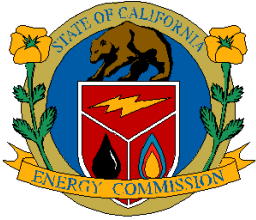
- ❖ **Prime Contractor: AEC**
- ❖ **Builder Partner: Pardee (Santa Clarita)**
- ❖ **Innovative Business Models/Sustainability:**
  - Utility business models for ZENH
  - Detailed proposal for utility Pilot Program
- ❖ **Status:**
  - Analysis on preliminary designs - 3 of 4 PIER ZENH goals met
  - Groundbreaking – April 2006



# Commercializing ZENH Communities



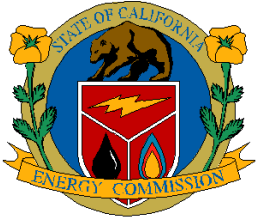
- ❖ **Prime Contractor:** PowerLight
- ❖ **Builder Partners:**
  - SunCrest (70 homes – Brentwood)
  - Multifamily Development (to be determined)
- ❖ **Innovative Business Models / Sustainability:**
  - Turnkey PV installation for builders
  - Enhanced roof-neutral BIPV design and SunTile BIPV product
- ❖ **Status:**
  - Construction – Summer 2006



# Affordable Multifamily ZENH



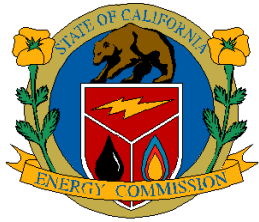
- ❖ **Prime Contractor:** Global Green USA
- ❖ **Builder Partner:**
  - Community of Friends (55 unit Project in LA)
  - Community Housing Works (56 unit Project in Poway)
- ❖ **Innovative Business Models / Sustainability:**
  - Affordable multifamily ZENH model
  - Outreach to State Treasurers Office and developers
- ❖ **Status:**
  - Analysis on preliminary designs - 3 of 4 PIER ZENH goals met
  - Groundbreaking – Spring 2006



# Possible ZENH Outcomes



- ❖ **New ZENH designs and business models that will be self-sustaining in the marketplace:**
  - Energy savings above 2005 Title 24 measures
  - Can be adopted by all electricity suppliers
  - Accelerated adoption of PV consistent with the California Solar Initiative
  - Cost-effective and market-oriented partnerships that benefit all parties (i.e., builders, PV industry, communities, and homeowners)
  
- ❖ **Statewide, 500,000 new homes with ZENH design by 2014 would provide:**
  - Annual electricity savings of 900 GWh from energy efficiency measures
  - 1600 GWh of electricity from clean, onsite solar generation
  - Consumer bill reductions of \$315 million
  - Peak demand reduction of 1500 Megawatts (equivalent to twenty 75 Megawatt peaking power plants)



# PIER Buildings Contact Information



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<http://www.energy.ca.gov/pier/buildings/index.html>