



A proposal for a
**Combined Efficiency + Solar
Residential Program**

Presented by
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The Point!!

We have residential efficiency programs
for existing homes,
and separate solar energy programs

**It would make a lot of sense,
economically, to put them together**

**Result: ZEEHs
(Zero Energy Existing Homes)**

Combined Efficiency + Solar Program



Residential Efficiency Programs for Existing Homes

Home Performance with ENERGY STAR

- Comprehensive, whole-house approach to improving energy efficiency and comfort at home, while helping to protect the environment. Contractors identify cost-effective energy efficiency improvements using state-of-the-art equipment. Available in 19 states.

ENERGY STAR Appliances and Lighting

- Promotes increased market share of highly efficient appliances and lighting equipment; often provide financial incentives; sometimes require turn-in of old working unit.

Residential HVAC

- Promotes increased market share of highly efficient central air-conditioners, air-source and ground-source heat pumps, furnaces, boilers, and water heaters.

Combined Efficiency + Solar Program



Residential Solar Energy Programs for Existing Homes

Solar-Electric (PV)

- Major programs in California and New Jersey
- Smaller programs in 14 other states
- Program financial incentives – combination of first-cost rebate and actual generation
- Federal income tax credit

Solar-Thermal (DHW / Swimming Pool)

- More limited availability of incentives
(e.g., California, Florida, Federal [DHW only])

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ZEHs (New Homes)




Combined Efficiency + Solar Program



ZEH (New Homes)


U.S. Department of Energy
Energy Efficiency and Renewable Energy
 Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable
Building Technologies Program


Building AMERICA
 U.S. Department of Energy
 Research Leading to Zero Energy Homes

ZEH Builders/Suppliers

 <p>SMUD SACRAMENTO MUNICIPAL UTILITY DISTRICT <i>The Power To Go More™</i></p>	 <p>CLARUM HOMES <i>Our Name Means Quality.</i></p>	 <p>contempo H O M E S CENTEX HOMES 50 Years of Homebuilding</p>
 <p>Habitat for Humanity™ www.habitat.org</p>	 <p>TREASURE Homes</p>	 <p>ARMORY PARK DEL-SOL</p>
 <p>AUSTIN ENERGY</p>	 <p>GE Energy</p>	 <p>PardeeHomes</p>
 <p><i>Morrison Homes</i></p>	 <p>SheaHomes <i>Caring since 1881</i></p>	 <p>IDEAL HOMES™ ANYTHING ELSE IS LESS THAN IDEAL</p>
 <p>POWERLIGHT™ SOLAR ELECTRIC SYSTEMS</p>	 <p>PREMIER HOMES INCORPORATED</p>	 <p>BOB WARD Companies</p>

Combined Efficiency + Solar Program



ZEH and ZEEH Benefits

- **Zero Energy Use – on an annual basis (Net metering; grid provides storage)**
- **Reduced demand during system peak**
- **Zero emissions**
- **Zero complaints (from homebuyers)**
- **Zero cost (83% in national survey indicated that positive cash-flow [mortgage & utility bills] would be satisfactory)**
- **Ideally suited for Time-of-Use tariff**
- **Improved occupant comfort**

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First Step: Efficiency Measures

- Home Performance with ENERGY STAR (diagnosis)
- ENERGY STAR appliances and lighting
- High efficiency windows (and doors) if needed)
- Reduce summertime solar gain
- Add thermal insulation to ceiling and under-floor (also walls and basement when feasible)
- Eliminate air-distribution duct leaks and heat losses
- When possible, switch to ground-source heat pump for space heating and cooling. If not feasible, install high-SEER ASHP
- ENERGY STAR electric DHW heater

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Then Add Solar Systems

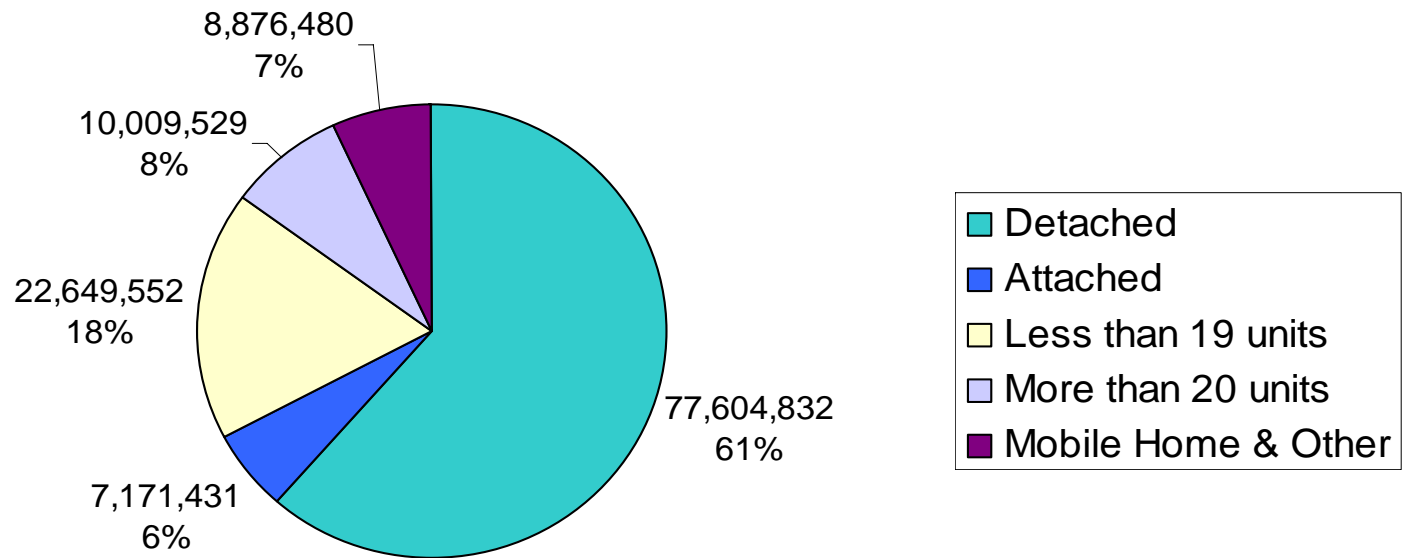
- **Solar DHW heating (~75% of end-use requirement)**
- **Solar PV (2-kW to 5-kW, based on estimated annual kWh requirement) [Only if roof is unshaded and south or southwest facing]**
- **If new roof is needed, install building-integrated PV (roof tiles w/built-in PV)**

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U.S. Housing Stock

2006 American Community Survey - U.S. Census Bureau



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Speaker Contract Information

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