



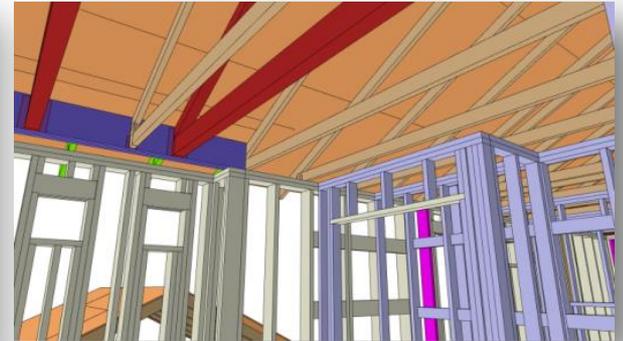
PV Tradeoff: High Performance Homes with PV

Jacob Atalla, VP, Sustainability Initiatives

BRAND

VALUE

INNOVATION



85,000 ENERGY STAR Certified Homes; 18,000 in CA

3,300 Solar Homes; 3,200 in CA

13 Net-Zero Energy Homes; 4 in CA



**ZeroHouse Model Homes in CA:
Lake Forest; San Marcos; Lancaster & El Dorado Hills**

Focus: Affordable High Performance Homes with Lower Total Cost of Ownership

High energy bills? The power to own is yours!



NEW CONSTRUCTION
+ ENERGY EFFICIENCY
+ INNOVATIVE DESIGNS
+ QUALITY CHOICES

LOWER BILLS

ENERGY STAR® qualified.
Energy efficient options
included at no added cost.
Your *Built to Order* home is
technologically innovative
and good for your wallet.



**Smarter, Healthier Homes Built For Saving
Money, Energy & Water**

Easy Math; Easy Savings



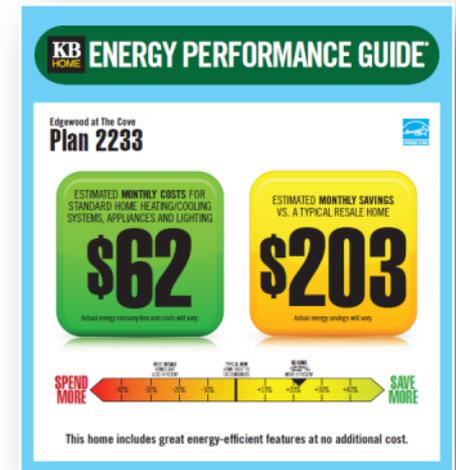
Edgewood at The Cove, San Jacinto, CA (built in 2013)

- 2,233 sq. ft. home
- Water & energy-efficient, high quality
- ENERGY STAR certified
- Energy management system
- 2.3 kW solar PV system

Savings in 10 Years:

\$24,000 energy bills savings
+ 3,000 water bills savings

\$27,000 total utility bills savings



Testimonial from homeowner: *"...going from 400, 500, 600 dollars a month [electricity bills at old home] to less than a dollar in some months, it just amazing!"*

Variable PV Credit

A Powerful Multiplier of Benefits for Builders and Homebuyers

- Builders need a stable construction practices strategy that has a longer cycle than 3 years
 - Knowledge base (internal & external) takes time to mature
- Variable PV Credit (allow builders to fix envelope practices while decreasing home energy use) can help both builders and homebuyers
 - Reduce risk & costs
 - Homebuyers are attracted to solar (value)
 - Longer warranty
- Ideas for integrating Variable PV Credit in 2016 Residential Energy Efficiency Standards
 - Solar credit needs to be proportional to system size
 - Solar credit should be allowed in all climate zones (let PV calculator determine kWh savings)
 - Solar credit should be allowed to trade off against ALL regulated loads



SunPower's 25-year warranty – effective useful life of solar is greater than an AC unit, or other building products with EULs that are shorter, yet get full credit in the Standards.



KB BUILT TO ORDER
zeroHOUSE 3.0

WELCOME

Join us for a tour of this
Double ZeroHouse 3.0 home.

- ADVANCED INSULATION & SEALING
- LOW-E WINDOWS
- HIGH EFFICIENCY HVAC
- HEAT PUMP WATER HEATER
- ENERGY STAR® SMART APPLIANCES
- SMART HOME TECHNOLOGY
- SOLAR & STORAGE SYSTEMS
- ELECTRIC VEHICLE CHARGING STATION
- GREYWATER RECYCLING SYSTEM





KB Home Fiora, El Dorado Hills, CA 2612 sq.ft.

• **Certifications:**

- DOE Zero Energy Ready Home
- ENERGY STAR
- WaterSense
- Indoor airPLUS
- 3rd party verification & tests

• **HERS Index Score:**

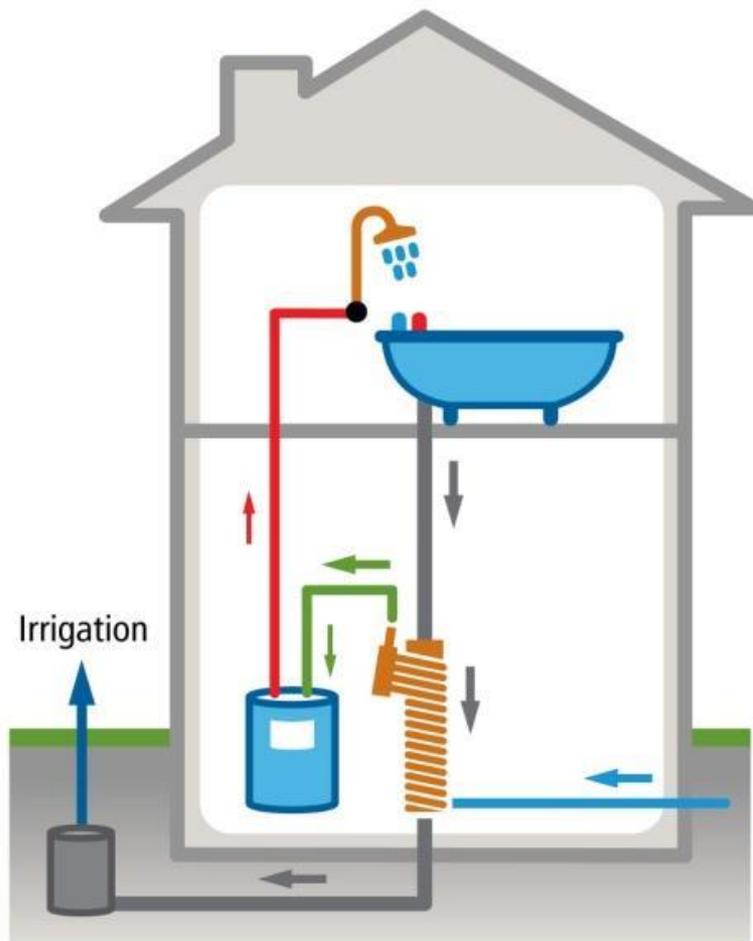
- 64 w/o solar PV system (standard ENERGY STAR home)
- “Load reductions” reduced score to 45 w/o solar PV system
- Zero w/ 7 kW solar PV system
- Estimated \$4,000+ in annual energy & water cost savings versus resale home

ZeroHouse components:

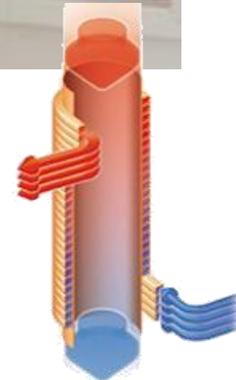
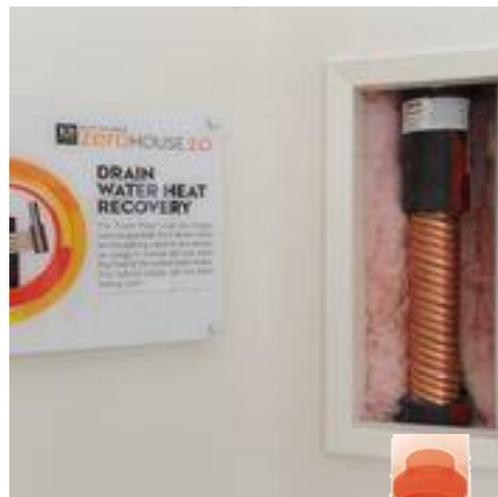
- Sealed attic (insul. @ roof deck; no vents)
- Ducts and A/C in “conditioned space”
- Higher efficiency A/C (19 SEER two-stage heat pump, coupled with the variable speed fan coil)
- Energy recovery ventilation (ERV)
- Improved wall insulation (R-15 in 2 x 4 with R-4.2)
- Slab edge insulation (R-10)
- Improved air sealing at select locations
- Higher performance windows (R-5)
- 100% LED lights (garage & outdoors use CFL)
- Smart appliances and induction cooktop
- WaterSense labeled fixtures & touchless kitchen faucet
- Hot water on-demand recirculation pump
- Solar PV system with storage and energy management system
- Home automation
- USB outlet at Kitchen counter
- Low-VOC paint & carpets; formaldehyde-free insulation
- Garage features EV charger
- Whole-house surge protector
- California-friendly landscaping
- Weather-sensing irrigation controller
- Grey water recycling system (with energy recycling)
- Dishwasher that recycles water
- Real-time water monitoring system

- 19 “load reduction” points cost \$1000/pt.
- 45 Solar PV points cost \$550/pt.
(both \$ figures are before incentives)

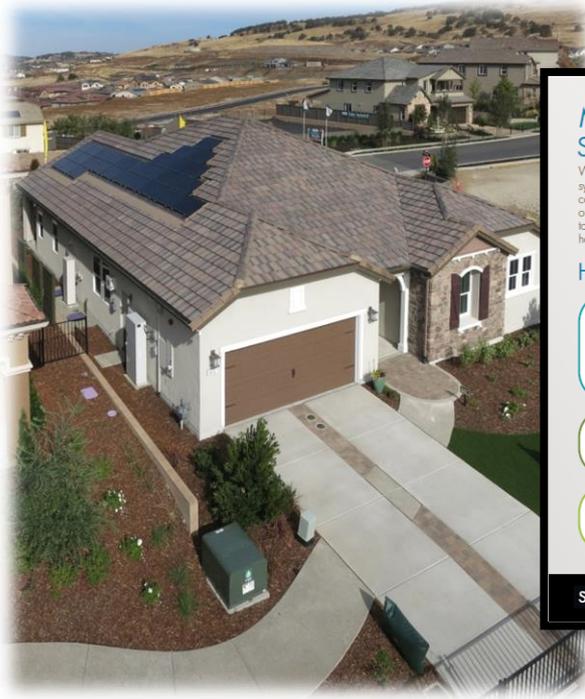
Water & Energy Recycling Systems



- Cold Water
- Pre-Heated Water
- Grey Water Recovery
- Hot Water
- Grey Water



KB Home and SunPower, Offering Battery Storage



MEET THE NEW NEIGHBOR: SOLAR + STORAGE

With energy storage capability, homeowners with solar power systems and home system monitoring today can control their electricity costs and have the security of knowing they'll have power during an outage. In the near future, the energy storage category is expected to experience substantial growth while adding additional benefits like home energy management.

HOW IT WORKS

- SOLAR PANELS**
Solar panels generate clean, reliable power during the day.
- MONITORING**
Homeowners can monitor their solar system's production and their family's energy usage online. Monitoring encourages energy saving behavior, increasing savings.
- BATTERY**
Today, batteries store power for use during an outage caused by a natural disaster or other factors. They potentially may be used to do any time to manage and reduce electricity costs.

US Forecast: Annual Behind-the-Meter Energy Storage Installed Power

WIS Consulting, The Future of Grid-Connected Energy Storage, Dec 2013

Year	Annual Installed Power (MW)
2012	0
2013	0
2014	~100
2015	~200
2016	~400
2017	~700
2018	~1000
2019	~1300

For more information visit: sunpower.com

