

Solar Successes

The Best of Today's Energy Efficient Homes



Why sell solar?

- Differentiates you from other builders
- Sells faster than homes without green options
- Saves money with shorter sales cycles and less inventory
- Complements good design and quality construction
- Enhances corporate image as environmentally responsible builder



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Builders across the United States are making breakthroughs in the design and construction of energy efficient homes. Working with their solar partners, these builders streamlined installations and demonstrated energy effectiveness along with consumer acceptance.

1) BelAir, Maryland – Bob Ward Companies started with a basement foundation of precast high-density concrete walls with an interior layer of rigid foam insulation plus R-19 fiberglass bat. He also included advanced framed upper walls and an R50 blown fiberglass ceiling insulation, plus foam sealing of all band joists, top and bottom plates, and wall penetrations. A house was kept open for a year to showcase the 3-kW photovoltaic (PV) system, solar hot water system, and super-efficient lighting and appliances.

2) Pleasanton, California – Builder of more than 350,000 homes, Centex's Avignon development is the first all-solar, energy efficient community built in the county. The 3.5-kW PV systems use SunPower integrated SunTile, which matches the dimensions of the cement roof tiles it replaced to blend in seamlessly with the roofing. Other energy-saving measures like R-49 attic insulation and R-15 wall insulation, high-efficiency windows and appliances, caulking, sealing, and independent air leakage testing help ensure energy savings of up to 70%.

3) Okefenokee, Georgia – Passive solar and cooling design elements cut energy use by 43% in this Georgia Department of Natural Resources cottage. By maximizing cross ventilation using sun-blocking overhangs like long screened porches and adding the heat-shielding power of structural insulated panels, the home's 4.1-kW PV system is able to more than meet all of the home's heating and cooling load in all but the two coldest months of the year.

4) Wheat Ridge, Colorado – This Habitat for Humanity home is well insulated with extra thick double stud walls sandwiching three layers of R-13 fiberglass batt, R-60 in the attic and R-30 in the floors. An energy recovery ventilation system retains heat while providing fresh air. The home is equipped with a 4-kW PV system plus three solar thermal water collectors on a drain-back system with a 200-gallon tank that provide nearly all of the family's electric and hot water needs.

5) Tucson, Arizona – This southwestern style development by John Wesley Miller Companies



includes rooftop solar panels for an integrated solar water heater and a 1.5-kW PV system standard on each of its 99 units. Steel-reinforced masonry walls with rigid insulation under a three-coat stucco finish, R-38 ceiling insulation, and low-emissivity dual-pane windows ensure a tight thermal envelope and high-efficiency appliances and ducts in conditioned space help reduce energy usage.

6) Tucson, Arizona – Pulte Homes selected a workable combination of active closed-loop solar thermal water heaters to meet the 5% solar requirement and an efficiency package to meet the energy savings requirement of 50% over local code. The package includes "cathedralized" application of blown insulation along the roof line of the attic to provide conditioned space for the ducts and air handler as well as air leakage testing, high-performance closed-combustion gas appliances, use of a drainage plane, flashing, and other water management details for 1200 to 1500 homes.

7) Olympia, Washington – It may be hard to believe solar can work in the cloudy, damp Pacific Northwest, but homeowner Sam Garst teamed with Building America and a building science-minded builder and architect to do just that. The house sports a 4.5-kW PV system, radiant heat and hot water from a ground source heat pump, advanced framing, a foam-insulated slab foundation, and Icynene spray wall and ceiling insulation, together with other green features like a greenhouse for passive solar heat, a rainwater cistern, construction recycling, fly-ash concrete, low VOC finishes, and bamboo and recycled tire flooring.

8) Columbus, New Jersey – Builder Mark Bergman pioneered the first all-solar development of market-rate homes in New Jersey, with 39 homes built to be at least 60% more efficient than code.

The heavily insulated, tightly sealed homes use energy-efficient appliances and lighting to cut energy use. To ensure maximum solar gain for his 2.64-kW photovoltaic systems, he located the panels on detached garden sheds, located anywhere on the lots, for ideal orientation to the sun.

For additional case studies, download the complete Building America *High-Performance Home Technologies: Solar Thermal & Photovoltaic Systems* publication at www.eere.energy.gov/buildings/building_america/pdfs/41085.pdf.

Additional Resources

Educational and Technical Assistance

U.S. Department of Energy Solar Program
<http://solar.energy.gov>

National Renewable Energy Laboratory
www.nrel.gov

DOE Building America Program
www.buildingamerica.gov

American Solar Energy Society
www.ases.org

Interstate Renewable Energy Council
www.irecusa.org

Solar Energy Industry Association
www.seia.org

Solar Electric Power Association
www.solarelectricpower.org

Economic Information and Tools

State Incentives
www.dsireusa.org

Solar Contractors and Cost Estimator
www.findsolar.com