

USA: Premier Homes – Premier Gardens

BIODATA

PV community name: Premier Homes – Premier Gardens
Kind of urban area: Residential – urban
Main building type in community: Houses - single houses
New/Retrofit/Added: New district/community
Type of project: Commercial project
Start of operation: Year 2004
City, state, etc.: Rancho Cordova, CA
Country: USA
Latitude: N38 25' 20"
Longitude: W121 18' 9"

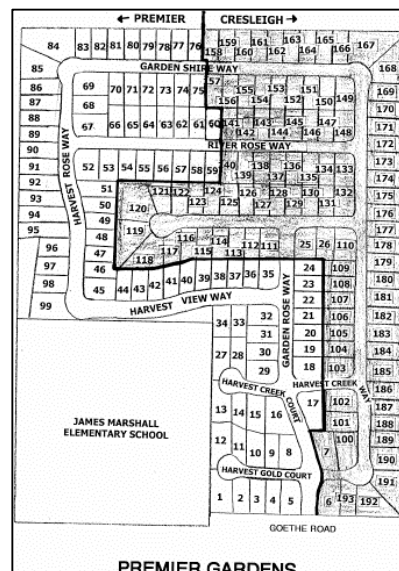
PV SYSTEM CHARACTERISTICS

Total PV power: 209 kW
Number of houses/buildings: 95 single-family homes
PV power per unit: 2.2 kWp
Energy yield per year: 3456 kWh per system
Main PV system type: Grid-connected - demand side
Main PV application type: Inclined roof – PV roof tiles
Main PV module type: PV roof tile
Main PV cell type: Multi-crystalline silicon
PV module manufacturer/brand: GE/GT-55
Inverter manufacturer/brand: Sunny Boy, SMA 2500
Investment for PV systems: \$10 000-\$15 000 for PV and efficiency

OWNERSHIP

Building owner: Inhabitant
PV owner: Inhabitant
PV energy user: Inhabitant

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PV COMMUNITY DESCRIPTION

PV Community Brief

Premier Gardens was the first near Zero Energy home (ZEH community) in the Sacramento area as well as the first for the builder, Premier homes. The plot of land was actually developed by two home builders. Cresliegh homes built 98 high efficiency homes and Premier built 95 near-ZEH homes. As noted by the plot layout the two types of homes are in close proximity allowing the opportunity for extensive energy analysis. The community is considered an entry level home buyer community.

Grid issue

There were no specific grid issues. The Sacramento Municipal Utility District (SMUD) is notably one of the most PV experienced US utilities. SMUD chose to decommission a nuclear power plant early and meet new demand with alternative energy and efficiency. The Premier Gardens development was part of their new home builder/ZEH program.

The side by side houses provided SMUD with the opportunity to monitor and analyze the energy use in occupied homes. The main utility focus was to decrease energy demand and more specifically the demand caused by air conditioners. Extensive analysis was performed on the side by side developments. The non-ZEH Cresliegh development was designed to surpass California's strict energy code by 30%. The Premier Gardens near-ZEH homes saved an additional 44% over the Cresliegh homes. On average, the demand savings was 60-70% during peaks. However, the broken roofline style allowed analysis of different PV orientations. The difference in annual energy production for different orientations was not more than 5% (decrease from latitude tilt – south). With the late afternoon peak, the west orientation provided an additional 42% demand reduction for a resulting overall reduction of nearly 80% or 1.3 kW peak on average.

Urban planning and architectural issues

The planning for this development had an energy focus. Yet the aesthetically desirable broken roofline and efficient land use layout was not compromised. The broken roofline once thought to be an orientation barrier for residential PV due to decreased energy production is now considered an asset in the SMUD service area. This is due to the minimal decrease in energy production relative to the substantially higher decrease in demand reduction. In addition to the energy analysis, occupant demographic and attitude analysis was also performed on this development with results of increased occupancy comfort and homeowner satisfaction. The orientation for this development was about 60% South, 24% West and 16% East.

Economic / financial issues

SMUD provided about \$7 000 towards the PV and \$500 towards the efficiency measures. The added cost to the construction for the PV and efficiency combined is \$15 000. Additionally, SMUD has tiered residential electric rates. The first 700 kWh per month use are charged 8 ¢/kWh and any use above this pays 15 ¢/kWh. The homes in Premier Gardens electricity use fell well under the first rate tier and the comparable homes at Cresliegh Gardens fell over to the second rate tier. The average bill for Premier Gardens is \$40/mnth, for the Cresliegh Gardens bill is \$56/mnth and the average for SMUD residential bills is \$73/mnth.

Other remarks

Premier Gardens was the first near-ZEH development for Premier homes and the first development for which PV was a standard and not an option. The builder feels that by making PV a standard, the installation cost are reduced by 40%. Though overall this is only about 10% of the PV system cost, these homes are mainly first time homeowner, lower cost homes and the builder has a minimal profit margin. Premier has standardized all their homes with PV and feels that the free publicity as well as the product differentiation has been extremely helpful for business now when the home market is at an all time low.

The development was built when the California building market was very strong. However, the Premier Gardens development started later and sold before the comparable Cresliegh Rosewood development.

COMMUNITY INFORMATION

Project leader company: Premier Homes

Other project company: ConSol

Project's www: <http://www.buildbypremier.com/>
<http://www.consol.ws/>