

USA: Grupe – Carsten Crossings

BIODATA

PV community name: Grupe- Carsten Crossings
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 2006 not yet completed
City, state, etc.: Rocklin, CA
Country: USA
Latitude: N38 47' 26"
Longitude: W121 14' 8"

PV SYSTEM CHARACTERISTICS

Total PV power: 345 kWp DC
Number of houses/buildings: 144 single-family homes
PV power per unit: 2.4 kWp DC
Energy yield per year: 3531 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: Mono-crystalline silicon
PV module manufacturer/brand: Sun Power/SunTile
Inverter manufacturer/brand: Xantrex
Investment for PV systems: \$15 000 for PV and efficiency after incentives

OWNERSHIP

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

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PV COMMUNITY DESCRIPTION

PV Community Brief

The Carsten Crossings neighborhood is one of 9 developments within the 1,200 acre Whitney Ranch development located in Rocklin, California. The Carsten Crossings project consists of 144 three-to-five bedroom, 2-3½ bath homes on lots that are 6,000 square feet or larger. The Carsten Crossings home designs are inspired by traditional ranch homes built in the area. The homes are considered middle class and market for about \$500,000. Grupe submitted the Carsten Crossings project for certification under the U.S. Green Building Council's LEED-H pilot program and is marketed as a "GrupeGreen" development, with many green building options such as soy insulation.

Grid issue

There were no specific grid issues. Pacific Gas and Electric has been interconnecting homes since California policy started in the mid 1990's. The homes were design to exceed the aggressive California Building Energy Code, Title 24, by 36%. With the PV array when facing south the energy savings jump to 54% better than Title 24.

Urban planning and architectural issues

Whitney ranch is a 1,200 acre amenity focused master planned community. In addition to the Community Park and Ranch House, Whitney Ranch features an extensive network of hiking and biking trails, acres of preserved natural open space, and neighborhood parks. The Grupe Builders, Carsten Crossings section has received acclaim for th architectural integration into the ranch style homes. Orientation was not an issue with only 5% difference(decrease from latitude tilt) for annual energy production of the PV system orientations other than south at this latitude.

Economic / financial issues

The energy efficiency and PV measure packages were evaluated using DOE-2 to estimate the value in utility savings and net cash flow to the buyers. Average incremental costs for the Grupe Homes improvements range from \$15,064 to \$15,576 after rebates, depending on the size of the home. If Grupe were to pass all of the cost of the energy efficiency measures (with incentives applied) through to the buyers, the total costs would amortize over 30 years at from \$1,203 to \$1,244 per year at 7 % interest rate. Utility incentives, including Energy Star Homes and rebates for Energy Star dishwasher and fluorescent lighting, ranged from \$1,025 to \$1225 (depending on the number of light fixtures). The houses also qualify for the \$2,000 federal energy efficiency 176 tax credit. California State PV rebates were taken by PowerLight and were included in the cost to the builder. The first year energy savings of \$1,557 are projected, yielding a positive annual cash flow that averages \$1053 for the various models and orientations. Including the PV systems, cash flow is still positive at \$828 per year.

Other remarks

The Carsten Crossings development is towards the back of Whitney ranch and yet has sold faster than the other developments.

COMMUNITY INFORMATION

Project leader company: Grupe Homes

Other project company: US Department of Energy Building America

Project's www: www.grupe.com