

Case Study

Long Meadow Ranch



Long Meadow Ranch's 50 kW solar PV system, is ground mounted approximately 2500' from the main winery and is designed to eliminate the \$14,865.00 annual cost of electricity required for all the winery's operations.

FEATURES

- The site for the Long Meadow Ranch solar array is located 2500' from the main winery, nestled between trees and brush, unusable for vineyards.
- Orientation of the solar array is situated at 225° SW at a pitch of 22°, taking full advantage of the peak time production hours.
- Total footprint of the array is 5,100-sq.ft.
- This system provides power to all electrical needs associated with the winery operations, administration functions, irrigation, and the caretaker's residence.

BENEFITS

- Long Meadow Ranch's annual electricity costs have been eliminated, translating into a savings of \$14,865.00 per year.
- The solar PV system cost \$453,440 and realized federal and state subsidies of \$345,104 (77% of the cost system). Net cost: \$108,336.
- Long Meadow Ranch only paid the net after rebate cost, as Sun Power and Geothermal Energy Co. financed, at zero interest, the balance of the total system cost.
- Energy cost savings over the warranted life span of the solar PV panels will total \$619,091.00.

50 Kilowatt Solar Photovoltaic System Long Meadow Ranch St. Helena, California

SITUATION

Long Meadow Ranch is a very unique business. Using their earth formed facility, the winery produces 100% organically grown world class wines and award winning olive oil. Additionally, through the use of sustainable farming methods, the winery also raises Scottish Highland grass fed cattle and Appaloosa horses.

While the main catalyst for considering solar PV for Long Meadow Ranch was to further their sustainable farming practices and stabilize rising electricity costs, the owners were also looking to improve the quality of power delivered to their site and reduce the number of required utility service entry points.

As Long Meadow Ranch is located on the outer perimeter of the utility's grid system, power quality delivered over their three phase service often failed or was unbalanced, causing damage on more than one occasion to sensitive communication equipment and irrigation pumps.

Prior to the installation of the solar PV system, Long Meadow Ranch received its power via three separate utility meters. Besides having unsightly overhead wires crisscrossing their property, Long Meadow Ranch had to pay the utility company for standby and account charges associated with the three meters, even when not in use.

ANALYSIS

Long Meadow Ranch's primary use of electricity is directed towards their wine making processes, irrigation pumps, olive oil production, and administrative functions. These main processes are distributed fairly evenly and typically averages 6000-8000 kilowatt-hours per month.

Total annual cost for electricity consumed, prior to installing the solar PV system was \$14,865.00. The 50 kilowatt solar PV system installed is calculated to eliminate the annual cost for electricity, providing for a payback of 6.5 years. Energy cost savings over the warranted life span of the solar PV panels will total \$619,091.00.



SOLAR SYSTEM DESIGN

SPG designed the 50 kilowatt solar PV system to eliminate the annual electricity requirements of three of Long Meadow Ranch's primary utility meters. The solar array was placed at a site 2500 feet from the winery's service entrance, with circuit branches replacing two of the formally utility fed sites. This highly engineered system combined three utility services into one and incorporated efficient transformers to minimize line loss over Long Meadow Ranch's new "mini solar grid."

This unique design eliminates the winery's annual electricity cost, enhances the quality and reliability of electricity, reduces redundant standby and utility account charges, and provides a single utility entry point for all of the winery's operations.

NET METERING

SPG designed the Long Meadow Ranch solar PV system to function within California's Net Metering regulations, which require public utilities to credit renewable energy producers for the electricity they send out to the grid.

After the winery takes the energy it needs from the solar array, the system automatically sends surplus electricity out to the grid. The electric meter runs backwards and Long Meadow Ranch earns credit for the energy they produce at the utility's retail rates. At night and on rainy days the winery uses grid energy, tapping into the credit it earned during sunny days.

SOLAR SOLUTION

Solar panels have a manufacturer warranty of 25 years and a useful life of at least 40 years. Solar systems run silent, are solid state and have no moving parts, and need no maintenance other than to spray dust off the panels during extended dry months of the year. Solar does no harm to the environment, livestock or crops under cultivation. Solar produces zero emissions- air, ground or water – ever.

SUN POWER & GEOTHERMAL ENERGY (SPG) designs and builds America's most powerful solar energy systems for business, government and homes, ranging in size from 1 kW to 1 mW, using online monitoring to verify production and return on investment.

SPG's turnkey services include:

- Feasibility Studies
- Needs Analysis and System Design
- Financing
- Engineering and Permitting
- Photovoltaic System Installation
- Electrical Service Commissioning
- Real-time Web-enabled Performance Monitoring
- Customer Care Program

Sun Power & Geothermal Energy Co., Inc. is a licensed and bonded General B and C-10 Electrical Contractor, California License 759086.

The Green Line

The 50 kW DC solar PV system prevents 58 tons of carbon dioxide from being released into the atmosphere annually by a natural gas power plant. It takes 4.6 acres of trees to filter this much CO2 from the atmosphere each year.



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