

## COMMERCIAL GRID-DIRECT PHOTOVOLTAIC SYSTEM: Mariani Packing Company

### Overview

**DESIGNER:** Brian Browning,  
commercial project engineer, groSolar,  
groSolar.com

**PROJECT MANAGER:** Frank Griffin,  
VP of construction, groSolar

**DATE COMMISSIONED:**  
December 3, 2008

**INSTALLATION TIMEFRAME:** 90 days

**LOCATION:** Vacaville, CA, 38.3° N

**AVERAGE SOLAR RESOURCE:**  
5.5 kWh/m<sup>2</sup>/day

**RECORD LOW/AVERAGE HIGH  
TEMPERATURE:** 16° F / 96° F

**ARRAY CAPACITY:** 1.11 MW STC

**AVERAGE ANNUAL AC PRODUCTION:**  
1,795 MWh

### Equipment Specifications

**MODULES:** 5,835 Evergreen Solar  
ES-190, 190 W STC, +2.5%/-2%,  
7.12 Imp, 26.7 Vmp, 8.05 Isc, 32.8 Voc

**INVERTERS:** 3-phase, 480 Vac  
system, 4 SMA Sunny Central SC  
250U, 250 kW each, 600 Vdc  
maximum input, 300–600 Vdc  
MPPT range.

**ARRAY:** Four 1,440–1,470 module  
subarrays; 15 modules per string  
(2,850 W, 7.12 Imp, 400.5 Vmp, 8.05  
Isc, 492.0 Voc), 96–98 strings per  
inverter (273.6–279.3 kW, 683.5–697.8  
Imp, 400.5 Vmp, 772.8–788.9 Isc,  
492.0 Voc)

**ARRAY INSTALLATION:** SunSeeker  
Single-Axis Tracker system from  
Thompson Technology Industries, 68  
rows with five tracking drive motors.

**ARRAY COMBINER:** 64 ReadyWatt  
combiner boxes

**SYSTEM MONITORING:** SunEdison  
Energy and Environmental Data  
System (SEEDS)



Courtesy sunedison.com

**M**ariani Packing Company wanted to install a solar electric system at its Vacaville, California, packing facility because it is fiscally sound and environmentally responsible. Now instead of just relying on the sun for plums, apricots, blueberries, apples and other fruit, the company also harvests clean, green electricity.

groSolar partnered with MP2 Capital and SunEdison to design and construct the system. One of the biggest design challenges was fitting the PV array, working around easements, underground utilities, drainage ditches and property line constraints. Blue Oak Energy provided electrical engineering services.



Courtesy blueoakenenergy.com

Thompson Technology Industries (TTI) designed the single axis tracking system, which resulted in a 12% increase in energy production over a 30° fixed tilt system.

Installed on seven acres of land owned by Mariani, the 1.1 MW grid-tied PV system is expected to supply about 23% of the facility's electrical needs. The system cost nothing to Mariani, which purchases its solar electricity under a solar power services agreement at long-term predictable rates equal to or less than retail prices.

"The fast installation and our financing partners' quick acceptance were proof of the quality of groSolar's design/build construction management approach, which resulted in the lowest cost and highest quality. We chose TTI, for example, for their durable product, competitive price and ability to drive down our installation costs. The SunSeeker Tracking System not only has robust design and construction, but also was quick and efficient to install."

—Jeff Wolfe, CEO, groSolar