

North Coast Solar **Stony Point Rock Quarry**

Courtesy North Coast Solar (4)



Overview

DESIGNER: Brian Hines, president, North Coast Solar, ncsr.com

LEAD INSTALLER: Steve Balich, field superintendent, Lunardi Electric, lunardieletric.com

DATE COMMISSIONED: February 1, 2014

INSTALLATION TIME FRAME: 90 days

LOCATION: Cotati, CA, 38.3°N

SOLAR RESOURCE: 5.5 kWh/m²/day

ASHRAE DESIGN TEMPERATURES: 93°F 2% avg. high, 27 °F extreme min.

ARRAY CAPACITY: 202 kWdc

ANNUAL AC PRODUCTION: 439,000 kWh

California's 52-year-old Soiland Company produces rock, soil and compost products at three locations in Sonoma County, California, and is the North Bay's largest recycler of rubble materials. When its electric bills nearly tripled overnight due to a new PG&E rate structure, the company enlisted local installer North Coast Solar and Vermont-based dual-axis tracker manufacturer AllEarth Renewables to design and develop a 202 kWdc tracker farm at its Stony Point Rock Quarry. The system has reduced Soiland's electricity bills by more than 50 percent and is projected to offset initial equipment and construction costs in approximately 7 years.

The project partners overcame many technical challenges, including the need to run ac transmission lines up the face

of the rock quarry and expansive soils that required the structural engineers to ignore the top 3 feet in their calculations. The pour-in-place foundations for the 33 AllEarth Solar Trackers required 30-inch-diameter, 13-foot-deep piers that are installed on a hillside behind the quarry. The trackers are fully pre-engineered, palletized and shipped directly from AllEarth. Installers used a jig to speed the assembly of tracker frames and a telescopic forklift to mount the tracker frames on the mast assemblies.

The site's original single service was on the PG&E E19 rate schedule and subject to very high demand charges. To optimize project economics, the designers added a second service and developed two separate PV systems. Two services reduced demand below 500 kW and qualified the two smaller



services for a solar-friendly bundled PG&E A6 time-of-use rate schedule that varies the kWh rate based on time of day and season.

System A serves the quarry's wet plant and HP400 rock crusher. It is interconnected at the new service and aggregates ac power from 15 Series 24 AllEarth Solar Trackers. System B interconnects the output of 18 Series 24 units at the reconfigured existing service and supplies power to the quarry's main plant. Each system has a separate 200 A 480 Vac subpanel. Installers used power poles to route separate 480 V lines down the face of the quarry, where

they interconnect at the site's main service panel.

Stony Point Rock Quarry's 202 kWdc array generated an impressive 439,000 ac kWh in its first year due to the Series 24 AllEarth Solar Trackers' GPS-based dual-axis tracking. In addition, the project's decentralized inverter design eliminates the possibility of a single point of failure in the power conditioning system. It will also

reduce future O&M costs.

"As part of this project, we installed two electric services that qualified the quarry for a rate schedule that did not include demand charges, just a bundled kWh charge. The result is a much more solar-friendly rate schedule that made the project economically feasible."

— *Brian Hines, North Coast Solar*

"The decision to go solar not only made economic sense, but really aligned with Soiland's values. Since the company's inception, we have always strived to be sustainable and environmentally responsible."

— *Mark Soiland, owner, Soiland Company*

Equipment Specifications

MODULES: 792 ReneSola JC255M-24/Bb, 255 W STC, +5/-0 W, 8.39 Imp, 30.4 Vmp, 8.86 Isc, 37.5 Voc

INVERTERS: 3-phase 277/480 Vac service; 33 SMA America Sunny Boy 6000-US, 6 kW rated output, 600 Vdc maximum input, 250–480 Vdc MPPT range

ARRAY: 12 modules per source circuit (3,060 W, 8.39 Imp, 364.8 Vmp, 8.86 Isc, 450 Voc), two source circuits per inverter (6,120 W, 16.78 Imp, 364.8 Vmp, 17.72 Isc, 450 Voc), 202 kWdc array total

TRACKERS: 33 Series 24 AllEarth Solar Trackers, dual-axis GPS-based array tracking; system includes one mast-mounted SMA America Sunny Boy 6000-US inverter and two-circuit ac load center (for inverter and tracker controller/motor) per tracker

SYSTEM MONITORING: DECK monitoring with CEC-approved revenue grade metering, AllEarth Renewables remote monitoring