

CalCom Solar

D'Arrigo California Ranch 7



Courtesy CalCom Solar (2)

Overview

DESIGNER: Tim McDuffie, PE, director of engineering, CalCom Solar, calcomsolar.com

LEAD INSTALLER: Brad Styer, project manager, CalCom Solar

DATE COMMISSIONED: April 2018

INSTALLATION TIME FRAME: 42 days

LOCATION: Gonzales, CA, 36.5°N

SOLAR RESOURCE: 6.811 kWh/m²/day

ASHRAE DESIGN TEMPERATURES: 77°F 2% average high, 30.2°F extreme minimum

ARRAY CAPACITY: 1,116 kWdc

ANNUAL AC PRODUCTION: 1,812 MWh

Headquartered in Salinas, D'Arrigo California is a premier grower, packer and shipper of quality fruits and vegetables. In April 2018, CalCom Solar commissioned the 1.1 MW D'Arrigo California Ranch 7 Phase 3 project, which increased the D'Arrigo's privately owned PV assets to 3.3 MW. The D'Arrigo California Ranch 7 Phase 3 installation presented unique challenges based on the existing operations and infrastructure. As opposed to aligning based on cardinal directions (north, south, east and west), Phase 3 aligned based on an old ranch map that showed a road running northeast to southeast. To avoid imposing major infrastructure redesigns, CalCom Solar utilized the flexibility of



the NEXTracker system to minimize project impact and align with the existing road and field edge.

With a moderate 1.8% slope, the project did not present the challenge of a steep site; nonetheless, the construction crews excelled at maintaining a uniform slope within the array to eliminate any potential shading from one row to the next. Using a dual-slope

PROJECTS

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laser, they calculated the north-south slope, as well as the east-west slope, and made a digital plane to drive the tops of piles to. Given the team's experience in dealing with slopes on past projects, it is no surprise that the project turned out as well as it did.

NEXTracker's design allows for greater flexibility compared with a central tracker system, enabling the crew to optimize system production by building the array on a 40° angle while keeping the 180° south azimuth. As this 40° angle presented a greater intrarow exposure than typical designs, CalCom worked with its structural engineering partner, Caruso Turley Scott, to size a foundation that would accommodate the increased exposure.

The Huawei inverters CalCom selected for the project communicate using power line communication (PLC) and reduce overall BOM cost by removing DAS wiring. On the interconnection side, current utility requirements for managing inverter islanding challenged the project. Utility engineers were concerned that the UL 1741-certified inverters on-site could potentially interact with existing Type III wind turbines on the same distribution substation. To address this issue, the initial ruling from the utility required the crew to install direct transfer trip (DTT)

at the substation to provide anti-islanding protection. To prevent undue loss of customer production credits, CalCom engineers collaborated with utility engineering managers to use the D'Arrigo Ranch 7 site as an opportunity to further understand islanding.

This ruling led CalCom to engage a third-party distribution engineer that conducted a substation specific study using Power Systems Computer Aided Design (PSCAD) and Electromagnetic Transients with DC (EMTDC) analysis programs to determine whether the potential for islanding existed. The utility provided the scope and details of the study along with local distribution system CYME database information. The results demonstrated to the utility's satisfaction that the risk of islanding in this circumstance was negligible, and it removed the DTT requirement.

"The utility granted a conditional permission to operate for the D'Arrigo California Ranch 7 Phase 3 project, and they permitted a portion of the project to go online 18 months ahead of schedule. This collaborative effort allowed the customer an additional 657,000 kWh of generation, which in turn will save the customer approximately \$88,695 over the course of 18 months."

—Tim McDuffie, PE, CalCom Solar

Equipment Specifications

MODULES: 3,600 Boviet BVM6612P-310, 310 W STC, +1.6/-0%, 8.22 Imp, 37.7 Vmp, 9.08 Isc, 45.8 Voc

INVERTERS: 3-phase 277/480 Vac service, 30 Huawei SUN2000-30KTL-US, 30 kW-rated output, 1,000 Vdc maximum input, 500 Vdc-850 Vdc MPPT range

ARRAY: 20 modules per source circuit (6,200 W, 8.22 Imp, 754 Vmp, 9.08 Isc, 916 Voc), 6 source circuits per inverter (37.2 kW, 49.3 Imp, 754 Vmp, 54.5 Isc, 916 Voc), 900 kWac array total

ARRAY INSTALLATION: Tracked ground mount, NEXTracker 120 SPT 2.1.1 independent-row self-powered trackers, 180° azimuth, 120° range of rotation

SYSTEM MONITORING: AlsoEnergy performance and portfolio monitoring

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