

PROJECTS

System Profiles

Sunlight Electric & Shamrock Renewable Energy Services VF Outdoor Coalition Campus



Courtesy Hawkeye Aerial Photography

Overview

DESIGN FIRM: Sunlight Electric,
sunlightelectric.com

INSTALLATION FIRM: Shamrock
Renewable Energy Services,
shamrockrenewable.com

DATE COMMISSIONED:
December 2012

INSTALLATION TIME FRAME:
160 days

LOCATION: Alameda, CA, 37.8°N

SOLAR RESOURCE: 5.3 kWh/m²/day

HIGH/LOW DESIGN TEMPERATURES:
per Solar ABCs solar reference map:
77°F/34°F

ARRAY CAPACITY: 855 kWdc STC

ANNUAL AC PRODUCTION:
1,123 MWh

In May 2011, VF Outdoor, a subsidiary of VF Corporation, broke ground on its four-building, 11-acre, 160,000-square-foot campus in Alameda, California, to consolidate locations for three VF brands: The North Face, Lucy and JanSport.

Consistent with these brands' commitment to the environment and innovative design, the campus incorporates many sustainability features, including indirect evaporative cooling HVAC that requires no compressors or refrigerants, energy-efficient T-5 lighting with motion sensors, FSC-certified wood, low-flow water fixtures, denim insulation, EV charging stations, vertical wind turbines and solar shades over the building windows on the east, south and west sides.

Even after construction was under way, VF's internal sustainability team continued exploring how to achieve its goal of net zero energy. VF tasked Sunlight Electric with achieving net zero status with PV while addressing and overcoming several issues and challenges. Limited roof space with 12-foot-high mechanical screens on the four building roofs reduced unshaded space for PV arrays. Unshaded space was also limited in the parking lot, and there was no space for ground-mount arrays, nor did the client wish to lose any parking spaces.

To overcome these site obstacles, Sunlight Electric designed a distributed PV system that includes four roof-mounted arrays and 12 carport arrays. A basic design emerged using Hyundai



Heavy Industries' HiS-M230SG modules on all roofs and carport locations. Hyundai agreed to eliminate any marine warranty exclusions without the added measures some other manufacturers require. With sites and modules selected, Sunlight Electric then looked at all the other project elements that it could incorporate to meet VF's needs. REFUSol's unique inverter capacity range (12, 16, 20 and 23.2 kW), 480 Vac/3-phase output, compact size and light weight enabled a cost-effective solution that complemented the system's distributed design approach.

This VF project was the first US application for Schletter's Park@Sol carports, which offer the durability of anodized aluminum and a major aesthetic advantage over traditional galvanized steel, cantilevered-box post-and-beam structures. Genmounts' custom-bent aluminum ballast pans enabled fine-tuning of the roof array tilt angles to the exact design requirements. All of these elements helped achieve the goal of respecting the design aesthetic of VF Outdoor's modern campus.



Courtesy VF Corporation (2)

"We were not satisfied with only a small percentage of our energy coming from renewable resources and believe our workplace should reflect our commitment to environmental responsibility. As a business, we define sustainability as achieving environmental, social and fiscal responsibility. This photovoltaic project with Sunlight Electric is a great example of meeting these requirements."

—Adam Mott, senior manager of sustainability, The North Face

"This project is the quintessential illustration of Sunlight Electric's needs-driven design ethos. As The North Face might say—never stop exploring—for the right technical and engineering solutions."

—Rob Erlichman, CEO and founder, Sunlight Electric

Equipment Specifications

MODULES: 3,720 Hyundai HiS-M230SG, 230 W STC, +3/-0%, 7.9 Imp, 29.4 Vmp, 8.4. Isc, 36.9 Voc

INVERTERS: 3-phase, 277/480 Vac service; 39 inverters total; 19 REFUSol 024K-UL, 23.2 kW; six REFUSol 020K-UL, 20 kW; six REFUSol 016K-UL, 16 kW; eight REFUSol 012K-UL, 12 kW; 500 Vdc maximum input, 125–450 Vdc MPPT range, 480 Vac/3-phase wye output

ARRAY SCHEDULE, ROOF

MOUNTED: Building A (20.2 kW), B (69 kW), C (69 kW), D (98 kW); 256 kW array capacity total

ARRAY SCHEDULE, CARPORTS:

Carport 1 (37.3 kW), 2 (35.9 kW), 3 (23.5 kW), 4 (147.2 kW), 5 (30.4 kW), 6 (31.7 kW), 7 (24.8 kW), 8 (15.2 kW), 9 (119.6 kW), 10 (23.5 kW), 11 (82.8 kW), 12 (27.6 kW); 599 kW array capacity total

ARRAY INSTALLATION, ROOF

MOUNTED: TPO roofing, Genmounts ballasted racking system, 218° azimuth, 5° tilt

ARRAY INSTALLATION, CARPORTS:

Schletter Park@Sol racking canopies, 128°–218° azimuths, 5° tilt

SYSTEM MONITORING: DECK

Monitoring with custom user interface integrating existing solar window shade project and wind turbine installations