



### Background

Navy Region Southwest is the Naval shore installation management headquarters for the Southwest region. It provides coordination of base support functions for naval operating forces throughout the region. The command also serves as the regional coordinator for the Commander, U.S. Pacific Fleet.

### Challenge

In response to California's energy crisis and the March 2001 Department of Defense call for demand reduction projects, Navy Region Southwest sought ways to reduce energy use in the San Diego metro area. As the largest energy user in the San Diego service territory, Navy Region Southwest evaluated renewable energy technology in order to reduce peak demand loads and daily energy consumption of on-shore facilities. Initiatives selected were based on technical innovation, cost-effectiveness, return on investment and potential benefits to other Naval activities.

*"Solar power proved to be the ideal energy solution for Naval Base Coronado. The photovoltaic system combines the environmental benefits of solar with the ability to provide a source of on-site power that serves to reduce our vulnerability to disruptions of the utility power grid."*

Wade Wilhelm  
Lieutenant Commander  
Navy Region Southwest  
Utilities Program Manager

## United States Navy Naval Base Coronado



### Solution

After evaluating multiple renewable energy alternatives, the Navy chose to install an on-site solar electric generation system at Naval Base Coronado. This system will reduce expensive electricity purchases from the utility grid during peak energy demand periods, while providing the Navy base with reliable, high quality power with minimal environmental impact.

The 924kwp photovoltaic system was designed and installed by PowerLight as part of a energy savings turnkey system with energy performance guarantees. This project was partially funded by the Federal government, and managed by Noresco, an energy service provider. The Naval Base Coronado system is the largest federal solar electric installation in the nation, and among one of the largest photovoltaic systems in the world.

The system is a unique solar electric carport which makes innovative use of an unused asset -- an existing parking lot. The solar electric carport generates power for the Navy base while providing shade and protection for over 400 vehicles, specifically for long-term parking for Navy personnel. The solar installation is comprised of two contiguous solar arrays, covering an impressive half-mile parking structure.

### Benefits

The electricity generated by the photovoltaic system is a reliable, high quality power supply. In addition to providing shade for parked cars, the solar system generates enough electricity during the day to power over 935 homes.

This grid-connected solar system reduces the Navy's electrical load, thereby reducing strain on the San Diego's electric operating system, as well as the region's transmission and distribution system.

The solar electric system will provide three percent of Naval Base Coronado's peak summer electricity load, and will save over \$228,000 in annual operating costs beginning in year one.

## UNITED STATES NAVY NAVAL BASE CORONADO

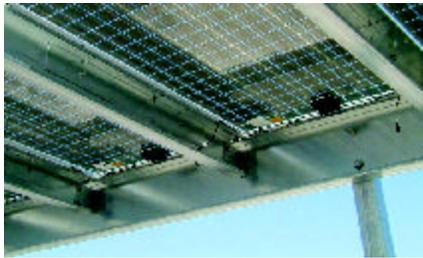
### ■ Specifications

Naval Base Coronado, Navy Region Southwest

Location: Naval Base Coronado, California  
 Date Completed: September 2002  
 System Size: 750 kWac  
 System Peak Capacity: 924 kW  
 Total Projected System Electrical Output: 1,244,000 kWh/yr  
 Number of solar panels: 3,078  
 PV surface area: 81,470 sq. ft.

#### Photovoltaic System Description:

The 750kW solar electric carport generates power for the Navy base while providing covered parking for over 400 vehicles, specifically for long term parking for Navy personnel. The carport solar array is made up of 3,078 photovoltaic panels, which delivers electricity directly to Navy's electrical grid.



The carport system features a fully engineered mechanical mounting system to securely fasten the solar electric panels, providing strength as well structural integrity. Indeed, the system is designed to meet 80 mile per hour wind conditions.

#### Photovoltaic System Configuration:

The solar system uses high efficiency photovoltaic modules to generate maximum power output per square foot. Each module has a maximum rated output of 300 watts. The carport system integrates photovoltaic modules, which use solar cells made of solid-state semiconductors to convert sunlight into direct current (DC) electricity. The DC output from the PV modules is converted to AC electricity by inverters located at the site, and then stepped up to 12k V, three-phase AC electricity by isolation transformers for connection to the Navy utility distribution system.

#### Environmental Benefits:

By avoiding the purchase of fossil-fuel generated electricity, Naval Base Coronado's solar electric system spares the environment from thousands of tons of harmful emissions, such as nitrogen oxides, sulfur dioxide and carbon dioxide, which are major contributors to smog, acid rain and global warming. It is estimated that over the 25-year lifetime of the photovoltaic system, the solar generated electricity will reduce emissions of nitrogen oxides by 11,660 lbs, sulfur dioxide by 10,480 lbs, and carbon dioxide by 7,430 tons. These emission reductions are equivalent to not driving 18,583 miles or removing 1,480 cars from California's roadways.

In addition, the 750kW system photovoltaic system generates the electrical energy equivalent to 2,488 barrels of crude oil annually.



### About PowerLight

PowerLight Corporation is the nation's leading designer, manufacturer and installer of grid-connected solar electric systems. Founded in 1991, PowerLight's distributed generation products produce reliable, affordable clean power for businesses and government agencies worldwide. Inc Magazine has ranked PowerLight Corporation among the top 500 fastest growing privately held companies in 2000, 2001 and 2002. Today, PowerLight has worldwide offices and a full line of commercial solar electric products.

### PowerLight's Mission

PowerLight is committed to making clean power a mainstream and affordable source of the world's energy supply. Our solar products enable companies to reduce operating costs by transforming clean, abundant solar energy into electricity.



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