

# NAS NORTH ISLAND - NAVY REGION SOUTHWEST NAVY ENVIRONMENTAL LEADERSHIP PROGRAM

## CONSERVATION

### BUILDING 678 PHOTOVOLTAIC SYSTEM

#### LEAD ACTIVITY

Navy Region Southwest (NRSW)  
Public Works Center (PWC) San Diego - Regional Energy Program Office

#### STATUS

Active

#### MISSION

Demonstrate a renewable energy project using principles of sustainable design and pollution prevention

#### REQUIREMENT

Support the Million Solar Roofs initiative and support compliance with Executive Order 13123, Greening the Government through Efficient Energy Management

#### DESCRIPTION

A rooftop grid-integrated 21.6-kilowatt (kW) photovoltaic (PV) system was installed at Naval Air Station (NAS) North Island Command Staff Building 678 to demonstrate how PVs can be used to provide clean electricity to charge electric vehicles. The PV system was installed by PowerLight Corporation and consisted of approximately 200 PowerGuard roof tiles capable of producing 116 watts each, and high efficiency AstroPower PV panels.

An electrical configuration of 20 tiles in each series string, 10 strings in parallel was used. A high efficiency Trace Technology inverter was used to obtain 480 volts-alternating current (Vac) three-phase power. In addition, a meteorological station along with a data acquisition system was installed. [View daily performance data the UPVG website.](#)



The PV system was connected to the electric grid of the building and is being used to offset energy used by four electric vehicle charging stations at Building 678. Currently,

two Chrysler Electric Powered Interurban Commuter (EPIC) minivans, one Electric Ford Ranger, and one Bombardier Neighborhood Electric Vehicle are stationed at Building 678. Further cost savings will be gained from energy production during peak demand periods. The system began operation on February 29, 2000 and generated a total of 30.54 megawatt-hours (MWhr) in year 2000.

PV system electricity is fed directly into the power grid for Building 678, providing all the power needed for three electric vehicles based at Building 678, and surplus electricity to offset Building 678 power requirements. Based on current rates paid for electricity, the PV system will generate more than \$7,000 per year of energy cost savings to the Navy. Over the 16-year payback period, the PV system will reduce 884,736 pounds of carbon dioxide emissions, and 288 pounds nitrogen oxide emissions.

For the project, cost-sharing partnerships were formed with the Chief of Naval Operations, Pollution Prevention Branch; California Energy Commission, Emerging Renewable Buydown Program; and the Utility Photovoltaic Group (UPVG), Team-Up Round 3 Program. These partnerships helped reduced the project installation costs by approximately 50 percent.

### **BENEFITS**

- Demonstrates the ability to implement a sustainable design project using the concepts of pollution prevention.
- Complies with the president's million solar roof initiative
- Reduces energy use and air emissions

### **ACCOMPLISHMENTS / CURRENT STATUS**

Date	Activity
OCT /1999	Complete PV system installation
JAN /2000	Submit Operation and Maintenance Plan
FEB /2000	Interconnect OK and system start up
APR/2000	<a href="#">NASNI PV Project wins San Diego Regional Energy Leadership Award! (download nomination)</a>
APR /2000	Evaluate potential for additional PV projects with NRSW
DEC /2000	Published (draft) PV system evaluation report

### **FUTURE PLAN OF ACTION & MILESTONES**

Date	Activity
MAR/2002	Design/Install PV system display for Bldg 678 visitors

### **COLLABORATION / TECHNOLOGY TRANSFER**

NELP is planning to develop a PV display for Building 678 to highlight the performance and benefits of the PV system and to showcase the Navy's commitment to renewable energy and the environment. The display will provide an opportunity not only to educate Navy personnel on the benefits of the PV system, but also to publicize the performance of the system to the general public.

### CONTACTS FOR FURTHER INFORMATION

Arno Bernardo	Navy Region Southwest (NRSW)	(619)524-6357 <a href="mailto:bernardo.arno.v@asw.cnrsw.navy.mil">bernardo.arno.v@asw.cnrsw.navy.mil</a>
Ken Decker	Public Works Center (PWC) San Diego - Regional Energy Program Office	(619)556-9166 <a href="mailto:DeckerKW@pwcsd.navy.mil">DeckerKW@pwcsd.navy.mil</a>

### BIBLIOGRAPHY

- Tetra Tech EM Inc. Photovoltaic System Evaluation Report, December 2000 (Draft)
- Tetra Tech EM Inc., Photovoltaic System Design and Equipment Specification Package, NAS North Island. September 1999.
- PowerLight Corporation, PowerGuard" Operation and Maintenance Manual for the Photovoltaic Project at Naval Air Station North Island, Building 678. January 2000.

### RELATED GOVERNMENT INTERNET SITES

- [DOE Million Solar Roofs](#)
- [Solar Electric Power Association](#)
- [DOE National Center for Photovoltaics](#)

DATED: 01/23/02