



**Halsey Terrace
Community Center**
Honolulu, Hawaii



Photo courtesy of William Boudra

Operational:
June 2008

System Size:
107 kW

Number of Panels:
477

Project Savings:
between \$32,000 to
\$48,000 annually*

Environmental Benefits:
270 barrels of oil saved
annually; avoids 140 tons of
carbon and sulphur dioxide
from being placed in the
environment.

**Assuming electricity cost is
between \$0.20-.30 per kWh*

Forest City

A U.S. Department of Energy Solar Showcase

Forest City is in the position to implement solar thermal and PV on 5,000-6,000 residential units, 12 community centers and several warehouses.

What is the Solar Showcase award?

Solar America Showcases are large-scale (greater than 100 kilowatts), highly visible solar installations that utilize existing or new solar technologies in an innovative way. Technologies involved include solar water heating, photovoltaics (PV)—a technology which turns sunlight into electricity—and large-scale solar thermal technology.

Why was Forest City selected?

DOE's Solar America Showcase award to builder Forest City in May 2007 provided hands-on assistance from technical experts to integrate solar thermal and electric technologies into the community. Forest City was chosen because thousands of military families will be exposed to solar technology benefits. The project also has great potential to share the lessons learned with other large Forest City developments or military sites across the country.

About the Forest City Project

Halsey Terrace Community Center's 107 kilowatt photovoltaic system shown in the photo above is the first installation of a larger project that could create 9 megawatts of power to benefit over 6,500 Navy and Marine Corp families in Honolulu, Hawaii. Forest City Hawaii is a public-private venture between the Department of Navy and the builder Forest City. The \$2 billion project is one of the largest real estate developments in the nation.

Forest City is in the position to implement solar thermal and PV on 5,000-6,000 residential units, 12 community centers and several warehouses. All new homes constructed feature solar water heaters, and existing homes are being retrofitted for solar PV. The project also includes new technologies such as hybrid PV thermal systems, which provide both heat and electricity.

The latest development phase calls for an additional 2-3 kilowatts of PV for each of the 759 housing units on Kaneohe Bay Marine Corps Base.



*Photo courtesy of Forest City
Military Communities*

Why is this project a showcase for wider adoption of solar technology?

HIGH REPLICATION POTENTIAL

Forest City's project with the Department of Navy is one of the largest real estate developments in the nation and is in a unique position to implement solar thermal and photovoltaics on a wide variety of buildings. Thousands of newly constructed homes will feature solar water heaters and existing homes are being retrofitted. Community centers, several warehouses and up to 30 acres of open space land are planned sites for additional solar installations. Several of the buildings already constructed are pre-wired and solar ready for future installations.

OPPORTUNITY TO SPREAD THE SOLAR EXPERIENCE

The solar homes are rented to military families, providing a solar experience to thousands of highly mobile individuals. An understanding of the benefits of living in a solar home travels with the family to other parts of the country when they move. Ultimately this may lead to future residential solar installations.

SHARE LESSONS LEARNED WITH FUTURE SOLAR PROJECTS

DOE saw potential to leverage Forest City's corporate breadth through the project. Forest City has a large number of real estate developments across the country that can take advantage of the latest solar technology advances and cost reductions learned in Honolulu. In addition, there are opportunities to share lessons learned to promote solar development at other large military installations.

Other factors that made this an ideal project

This project builds on the recently established Hawaii Clean Energy Initiative (HCEI) signed by Hawaii Governor Lingle and former Assistant Secretary Andrew Karsner. HCEI is a long term partnership designed to transform Hawaii's energy mix into one that utilizes renewable energy and energy efficient technologies. The partnership goal supports Hawaii utilizing 70% clean energy by 2030.

Hawaii has a strong economic reason for making solar energy part of their energy mix. 80 percent of the state's electricity is generated from burning petroleum, making the price of power vulnerable to market volatility. The retail cost of electricity is currently the highest in the country. At prices close to \$0.20 per kilowatt hour, PV systems start to become affordable, and solar hot water systems make financial sense.

Forest City also had strong economic reasons for investing in this project. It has a 50-year contract to maintain and reinvest in the homes they build in Hawaii, creating a unique opportunity to invest in long-term solar technology which could result in long-term profits.

“DOE's Solar Showcase award provided Forest City the ability to implement a photovoltaic program. The technical and financial expertise provided by the team added a level of PV experience that we previously didn't have. The lessons we learned will allow us to roll the PV program out to a large portfolio of projects and share our experience with other Forest City projects across the nation.”

JON WALLENSTROM

Senior Vice President

Forest City Military Communities Hawaii



U.S. Navy photo by Richard Saltzman

How did DOE play a role?

DOE provided hands-on assistance from technical experts to integrate solar thermal and electric technologies into the community. The team was led by Sandia National Labs and was made up of solar specialists from the National Renewable Energy Laboratory, New Mexico State University, Sandia National Laboratories and the competitively-selected consulting firm CH2M HILL. The team provided analysis, infrastructure assessments, information on financial options, technical construction recommendations, and project management skills, all of which resulted in the development of a viable business model for large-scale PV adoption.

Forest City Military Communities commissioned the Halsey Terrace photovoltaic system on June 16, 2008 at a ceremony including **Rear Admiral T.G. Alexander**, commander, Navy Region Hawaii, **Jon Wallenstrom**, senior vice president of Forest City Military Communities Hawaii, Hawaii's **Governor Linda Lingle**, **Tom Kimbis**, Director of the Solar America Showcases, Department of Energy and **Rear Admiral Michael Giorgione**, commander, Naval Facilities Engineering Command (NAVFAC) Pacific.