



## Zero Net Energy Project Profile

Office



Photo: David Livingston (Left) and Jeremy Bitterman (Right)

## OVERVIEW

### Site Details

**Building Size:** 49,161 SF  
**Location:** Los Altos, California  
**Construction Type:** New  
**Construction Year:** 2012  
**Building Type:** Office  
**CA Climate Zone:** 4

### Measured Energy Stats

$$24 - 28 = -4$$

BUILDING'S TOTAL EUI      RENEWABLE PRODUCTION EUI      BUILDING'S NET EUI

### Site Energy Use Index (EUI) kBtu/SF/year

The Energy Equation: **the building energy use minus the renewables production equals the net energy of the building.** Buildings may be 'Getting to Zero' and have a net EUI above zero. If renewable production exceeds energy use its net EUI is below zero (negative) and it is creating surplus energy.

## DAVID AND LUCILE PACKARD FOUNDATION

When the Packard Foundation started thinking about building a new headquarters, they wanted to make sure the final product reflected the organization's values. These include conserving the Earth's natural resources over the long-term, providing a comfortable and healthy space that supports collaboration for its employees, and contributing to the vitality of downtown Palo Alto. The new two-story office building features two long, two-story wings connected by enclosed walkways and organized around a landscaped courtyard. The program included private offices, open work areas, communal gathering spaces and conference rooms for approximately 120 employees.

## Planning & Design Approach

Overarching project goals were:

- Create a project to serve as a catalyst for the organizations broader sustainability initiatives by targeting zero net energy use and LEED Platinum certification
- Provide a range of public and private work spaces that encourage collaboration and are outfitted for virtual work opportunities
- Have a transparent presence that interfaces well with the local community

## Energy Efficiency Strategies & Features

**Daylighting:** By configuring two narrow (40 feet) office wings around a central courtyard the design team maximized the building's daylighting potential. Clerestory windows and skylights allow ample natural light to fill the open office areas which feature daylight harvesting lighting controls. To handle uncomfortable glare the building features multiple layers of shading including large overhangs and automatic exterior and interior blinds that respond to the movement of the sun.

**Climate Responsive Cooling:** A cooling tower provides chilled water to a 50,000-gallon storage tank that is passively cooled during nighttime hours. The water is circulated throughout the building to chilled beam exchangers. These chilled beams cool the localized air, allowing it to sink into the space and displace

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For more information:  
[newbuildings.org/zero-energy](http://newbuildings.org/zero-energy)



Photos: Jeremy Bitterman

### Team/Owner Details

**Owner:** The David and Lucile Packard Foundation

**Architect:** EHDD

#### Landscape Design:

Joni L. Janecki & Associates

**Mechanical Engineering:** Integral Group

**Structural Engineering:** Tipping Mar

#### Civil Engineering:

Sherwood Design Engineers

**Geotechnical Engineering:** Fugro West

#### Electrical Engineering:

Integrated Design Associates, Inc.

**Project Management:** Rhodes/Dahl

**Lighting and Daylighting:** JS Nolan + Associates Lighting Design, LLC.

**General Contractor:** DPR Construction

**Electrical Contractor:** Redwood Electric Group

### Financing & Cost

**Shell cost:** \$477/SF (Includes roof, walls, windows, heating, cooling, plumbing, elevator, and solar panels)

### Awards

LEED® Platinum

ILFI™ Net Zero Energy Building Certification™

warm air. Outside ventilation air is provided by a secondary dedicated outdoor air system (DOAS). Building occupants are notified by an icon that appears on their computers when it is appropriate to open operable windows.

**High Performance Envelope:** The design team was able to downsize the heating system by selecting triple-paned windows and reducing thermal bridging opportunities throughout the envelope. The added cost of selecting a better performing window was more than offset by reducing the heating load as well as downsizing the photovoltaic system.

**Plug Loads:** Building occupants are able to track, via dashboard on their personal computers, how much energy they are consuming in real time. In addition the design team provided a step-by-step manual to the building owner on how to keep plug loads down.

### Lessons Learned

- Members of the design team conducted a plug load study on the old Packard Foundation offices, providing fundamental insight into how to design specifically for this organization. This study revealed savings opportunities associated with computers, monitors and printers. This and other insights from the study allowed the design team to set and meet their plug load energy budget.
- The architecture firm included in their scope of services a year-long post-occupancy survey that aimed to assist the organization in meeting its zero net energy goal. This was the first time the firm had implemented a contractual, post-occupancy requirement to ensure the building functions according to design. This is seen as a critical element for buildings with net zero energy goals.

### For more information:

**GreenSource Case Study:** <http://goo.gl/46tnlo>

**Plug Load Study:** <http://goo.gl/qUvrPy>



Administered by California utilities, Savings By Design encourages high-performance, non-residential building design and construction, and a variety of solutions to building owners and design teams. More information at: [savingsbydesign.com](http://savingsbydesign.com).



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