



## Zero Net Energy Project Profile

Small Office Retrofit



Photos: David Hewitt/ Ann Garrison Architectural Photography

### OVERVIEW

#### Site Details

- Building Size:** 33,400 SF
- DPR Office Size:** 24,000 SF
- Location:** San Diego, California
- Construction Type:** Renovation
- Construction Year:** 1984, 2010
- Building Type:** Small Office
- CA Climate Zone:** 7

#### Measured Energy Stats

$$15 - 17 = -2$$

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

### DPR CONSTRUCTION

Acting as owner, designer and contractor, DPR rehabbed a near-obsolete, 1984 building into a vibrant, zero-net energy multi-tenant office. DPR's new 24,000 SF tenant improvement includes an open office space along with 11 conference rooms, a large gathering area and a space dedicated to building information modeling technology. The building takes advantage of the mild climate, relying on cross and stack ventilation strategies that significantly reduce the amount of time the mechanical HVAC system is used. Natural light now fills the space, unlike before the renovation when acoustic tiles and an eight-foot ceiling height minimized daylighting opportunities.

#### Planning & Design Approach

The concept of 'making the best with what we have' guided the design. The building demonstrates DPR's cultural commitment to openness and transparency. Instead of private offices, the space includes an open office environment that use sails to artistically cover the 14-foot exposed ceiling and diffuse light throughout the space. Other goals reflected in the design include respecting the individual and connecting occupants to the outdoors.

#### Energy Efficiency Strategies & Features

**High Efficiency HVAC:** The hybrid natural/mechanical HVAC system, designed to take maximum advantage of passive strategies, has reduced the HVAC operating hours by 79% annually. A state-of-the-art interconnected skylight building management system automatically opens windows and skylights and turns mechanical systems off when outdoor temperatures are within a certain range. Cross and stack ventilation are assisted by high-volume, low-velocity ceiling fans in the open office area.

**Daylighting:** Improving the penetration of natural light into the space was a main focus of the tenant improvement project. Strategies include the addition of 36 Solatubes, operable roof monitors and skylights and glass garage-style doors. Stripping the film from the existing windows also increased the amount of light into the space.



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



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*“We wanted to set an example in our industry by changing the way commercial office buildings are designed and built with the goal of improving the world we live in.”*

Jay Leopold, Regional Manager,  
DPR San Diego

#### Team/Owner Details

##### Owner/designer/builder:

DPR Construction

**Architect:** Callison Architecture Inc.

**Sustainable Design Consultation:**

Kema

**Structural:** Hope Engineering

**Civil:** Latitude 33

**Landscape:** Howard Associates

**Electrical Services:** Berg Electric

**Mechanical & Plumbing Services:**

Pacific Rim Mechanical

#### Awards

LEED® Platinum

Savings By Design Merit Award

**Lighting:** Photosensors automatically turn off electric lights when 30 footcandles are available from daylighting. Occupants control their own task lights.

**Renewables:** The building has a 64 kW AC photovoltaic array mounted on the roof.

#### Lessons Learned

- One-story, tilt-up suburban office buildings can be transformed into vibrant, low-energy office spaces. Creativity and attention to passive strategies such as daylighting and natural ventilation can significantly decrease energy loads at a reasonable cost.
- Zero-energy buildings require more time in the front end of the design process than a conventionally designed structure. Extensive energy modeling can help the team refine strategies.
- Occupant complaints dropped because they have control over lighting, operable windows and ceiling fans.
- DPR's office space is an effective tool to educate clients on what is possible even in outdated buildings.

#### For more information

##### Savings By Design Case Study:

[www.savingsbydesign.com/award-winners/2010/dpr-construction-net-zero-office](http://www.savingsbydesign.com/award-winners/2010/dpr-construction-net-zero-office)

**DPR Construction Website:** [www.dpr.com/projects/san-diego-net-zero-office](http://www.dpr.com/projects/san-diego-net-zero-office)

**DPR Construction Building Dashboard:** [www.buildingdashboard.net/dpr/#/dpr](http://www.buildingdashboard.net/dpr/#/dpr)



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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