

Project Profile

**Zero Net Energy
Retail Bank
Branch**



Photo courtesy of Turner Construction

Overview

Site Details

- Building Size:** 3,970 SF
- Location:** Ft Lauderdale, Florida
- Construction Type:** New Construction
- Construction Year:** 2011
- Building Type:** Retail Bank
- Climate Zone:** 1A

Measured Energy Stats

92	-	96	=	-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.

TD BANK

TD Bank has been an environmental leader since 1990. As one of the ten largest banks in the United States, they chose to move beyond LEED certification to pilot a Zero Net Energy design for a retail bank branch in Fort Lauderdale, Florida. By enhancing the already high performance building components standard in their portfolio, the design and construction team focused their attention on further reduction of energy loads and installation of renewable energy on the site. Their concerted and ongoing effort toward this net zero result helped TD Bank achieve their goal.

Planning & Design Approach

The goals of the project were to reduce operational cost, energy use and greenhouse gas emissions. The process started with a green prototype to develop a cost-effective base building. This standard design was adapted to the local community through a pre-defined kit of parts. More than 80% of the building components are the same as those in their typical branch design.

Energy Efficiency Strategies and Features

High Performance Envelope - Low-E glazing, shaded windows and increased insulation help reduce overall building energy consumption to approximately 40% below code levels.

Daylighting - A design with roof monitors and carefully controlled daylight harvesting along with advanced lighting controls reduce the electrical lighting load to an operational 0.78 Watts/SF from a connected load of 1.18 Watts/SF.

Project Team

Owner: TD Bank

Architect: Bergmann Associates

Contractor: Turner Construction

Energy Consultant: Spiegle Architects

Solar Consultant: Solular Energy

Civil: Bohler Engineering

Awards

LEED® Platinum

For more information:

TD Bank Press Release:

<http://goo.gl/xr36oG>

Exterior Lighting - 400-Watt metal halide site lights were replaced with 210-Watt LED exterior lights with step dimming control for an energy savings of 18,550 kWh/Year (64%).

High Efficiency Mechanical System - The HVAC design features a variable refrigerant flow (VRF) system with 10 separate zones. A split system with modulating digital scroll compressors and hot gas reheat is used for dehumidification. An air-to-air heat exchanger tempers incoming ventilation air. Dehumidification is set to turn off at 72% relative humidity.

Commissioning - Building commissioning uncovered a number of challenges with the systems and controls. Temperature setpoints were not set properly, and mechanical dehumidification was occurring 24/7. The commissioning agent also reprogrammed the lighting controls to maximize savings. Finally, commissioning revealed that the metering was inadequate, and the main PV field was not being accounted for in any metering calculations.

Plug Loads - Plug loads represented 40% of total energy consumption. The standard three-hot-plate coffee maker was replaced with an insta-hot 'eco' version. This saved 660 kWh/year (91% over standard practice).

Photovoltaics - 86 kW of roof and site-mounted PVs (400 panels) generate 100% of the electricity used onsite.

Lessons Learned

- Since plug loads comprised such a large percent of the overall load, understanding and optimizing equipment (such as office equipment, ATMs, computers and monitors) is key.
- Retrocommissioning focusing on the net zero energy goal was required, in addition to fundamental commissioning. The retro-commissioning agent fine-tuned the building and helped the bank achieve its aggressive energy goals.
- Photovoltaic systems had to be carefully sized and located. Based on predicted energy use from the design model, additional PV arrays had to be mounted over open ground. Shading studies were a critical part of the design because any single inverter subject to shade can disrupt power generation for the whole array.
- The actual cost of the net zero improvements was 19.8% higher than baseline construction. However, federal PV tax credits reduced the first cost of the renewables, so the cost increment was only 12.4%. With energy costs eliminated, the net zero enhancements paid for themselves in only eight years.

New Buildings Institute

New Buildings Institute (NBI) is a nonprofit organization working collaboratively with commercial building professionals and the energy industry to improve the energy performance of commercial buildings.