

Local Union 332 of the International Brotherhood of Electrical Workers (IBEW) Union Hall

2125 Canoas Garden Ave. #100
San José, CA 95125

Overview

In 2018, members of Local Union 332 of IBEW and the Santa Clara Valley Chapter of the National Electrical Contractors Association completed an impressive ZNC building retrofit of their union hall in downtown San José. This retrofit converted all building operations to all-electric. The on-site solar power offsets more than 100 percent of its energy usage through net energy metering.

Project Size 31,000 square feet

Construction Type Retrofit

Completion Year 2018

Building Use Type Office

Total Building Retrofit Cost \$3.2 million
Hard Costs \$2 million
Soft Costs \$1.2 million

Measured Energy Stats (Net EUI) 10 kW/square foot

A ZNC building is designed to meet all its energy needs from carbon-free sources such as solar or wind. To achieve this, buildings cannot use natural gas or other fossil fuels in their operation.

Planning

Innovation isn't new to Local 332. In 2001, it installed the first commercial-scale solar array in San José. The building managed California's rolling blackouts in 2000 by using its solar-powered backup battery system.

By 2015, the early solar system, which had kept the costs of building operations low, was degraded and incurred more than \$140,000 per year in utility, operations and maintenance costs. Instead of merely replacing the solar system, Local 332 saw this as an opportunity to demonstrate its expertise through a more comprehensive building retrofit.

Financing

Local 332 used NECA's Energy Conservation and Performance and Platform (E-CAP), a tool-based system and program that provides access to best practices and financing information for energy projects. Local 332 was able to finance the \$3.2 million retrofit without any out-of-pocket expenses through equipment leases. IBEW leased the new equipment and features for a fixed term and used energy cost-savings to pay for them.

CASE STUDY ON ZERO NET CARBON (ZNC) BUILDINGS

Strategies & Features

The retrofit included 17 new energy-related features and measures that resulted in more than \$140,000 of savings in energy costs. The main retrofits included:

1. **Solar Photovoltaic Panels** were upgraded from 4 kW to 202.3 kW to offset the building's energy use, virtually eliminating utility costs.
2. **Battery Storage System** ensures that continuous core systems are powered by renewable energy in event of outages.
3. **Electric Vehicle Charging Stations** were installed to power a new electric vehicle fleet from the solar array.
4. **Skylights and Daylight Dimming Controls for LED Lights** take advantage of sunlight and eliminate the need for lights during the day.
5. **Building Envelope** has an improved R-value with high solar reflectance index paint on the roof and walls to prevent heat absorption.
6. **HVAC & Water Heating Systems** were switched from natural gas to all-electric powered by the new solar array and the San José Clean Energy TotalGreen option.
7. **Plug Load Control Devices Management** prevents vampire loads, or electricity consumed by devices left in standby mode or plugged in.
8. **Monitoring System** tracks the building's energy use from the lighting, HVAC and solar systems, which can identify and anticipate future operational and maintenance needs.

Success

The Union Hall retrofit is a proven example that ZNC buildings have a triple bottom line impact:



Financial Benefits

Utility costs were virtually eliminated with on-site solar. Operating costs were greatly reduced with more energy-efficient systems. Maintenance costs were minimized with guaranteed long-term equipment life spans.



Environmental Benefits

IBEW Local 332 eliminated the use of natural gas in its building operations and generates all electricity through on-site solar, significantly reducing its greenhouse gas emissions. As a customer of San José Clean Energy, IBEW receives electricity from renewable resources (wind and solar) and carbon-free resources (hydropower).



Social Benefits

IBEW Local 332 highlighted its skills and expertise in retrofitting ZNC buildings while also demonstrating the importance of a strong workforce to advance the City and state's ZNC building goals.

Learn more about ZNC buildings and
read other case studies at
sjenvironment.org/ZNCBuildings

