



Reducing Idle Power Consumption in Office Spaces Saves U.S. Navy in Energy Costs

As part of a two-year project to demonstrate energy efficiency measures, renewable energy generation, and energy systems integration, the National Renewable Energy Laboratory (NREL) has identified advanced plug load controls as a promising technology for reducing energy use and related costs in the U.S. Navy's Naval Facilities Engineering Command (NAVFAC) office spaces.

The demonstration was one of eight technologies studied at bases in Hawaii and Guam, and evaluated the benefits and compatibility of the technology with the Navy's mission and practices. The overall project focused on identifying new or underutilized commercial technologies that could help meet the Navy's ambitious energy goals of producing at least 50% of shore-based energy from alternative sources and ensuring that 50% of Navy and Marine Corps installations will be net-zero energy.

A collaborative effort by the NREL-NAVFAC integrated project team was a key success factor to the project, resulting in technology demonstrations that met stringent Navy requirements while providing credible performance data to help guide energy-related decisions.

Advanced Power Strips for Offices

Advanced power strips, a plug load control technology that cuts power to devices plugged into electrical outlets when they are not in use, were installed in a 100-occupant office building on Joint Base Pearl

The Technology Demonstration

Overview

NREL installed and monitored advanced plug load controls in a 100-occupant office building located on Joint Base Pearl Harbor-Hickam in Hawaii.

Key Results

While modest energy savings were originally predicted, the demonstration showed the Navy could reduce plug load use by 28% and decrease the entire building's energy use by 8%.

Harbor-Hickam in Hawaii. While plug load savings are dependent on what can be turned off and for how long, the demonstration identified measurable savings.

One hundred advanced power strips were deployed at workstations and in print rooms and break rooms to reduce idle-time power consumption, which primarily occurs during nights and weekends. NREL also assessed the building's plug loads and circuits, installed metering at the circuit and plug levels, discussed the device's scheduling features with most occupants, and monitored the advanced power strips' usage in order to quantify the direct energy savings.

In a minimally code-compliant office building, plug loads typically account for 25% of the total electrical load. In an ultra-efficient office building, plug loads can account for more than 50% of the total electrical load.¹

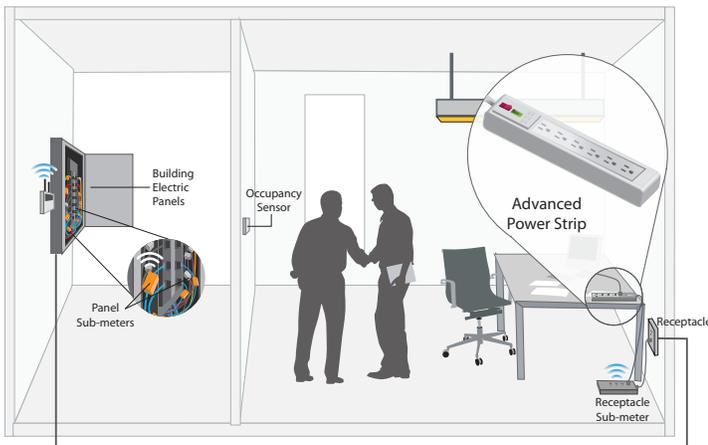
¹ C. Lobato, S. Pless, M. Sheppy, P. Torcellini. "Reducing Plug and Process Loads for a Large Scale, Low Energy Office Building: NREL's Research Support Facility." NREL/CP-5500-49002. February 2011.

Only modest energy savings were initially predicted because the building occupants had already managed to reduce their building energy consumption by 75% over the previous four years. However, by setting an occupant-selected schedule that eliminated unnecessary nighttime and weekend plug loads, the entire building's energy consumption was lowered by 8%. Plug load consumption decreased by 28%. Given the small investment required, the application pays for itself in less than two years.

Percent Energy Savings by Space Type in Demonstration Building

Open Office	Private Office	Reception Areas	Print Stations	Hallway
32.6%	16.5%	34.8%	66.0%	21.8%

To learn more about the demonstration projects, download the NAVFAC Hawaii and Guam Energy Improvement Technology Demonstration Project reports at nrel.gov, visit NREL's Department of Defense website at www.nrel.gov/defense/, or contact Jeffrey Dominick at jeffrey.dominick@nrel.gov.



Advanced power strips installed in an office setting can reduce idle-time energy consumption, lowering energy costs.

Illustration by Marjorie Schott, NREL, iStock 14556886 and 15173394

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NREL is a national laboratory of the U.S. Department of Energy
 Office of Energy Efficiency and Renewable Energy
 Operated by the Alliance for Sustainable Energy, LLC

NREL/FS-5A00-61272 • April 2014