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CISCO'S GLOBAL LAB ENERGY MANAGEMENT PROGRAM

CISCO SYSTEMS

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Networking equipment supplier Cisco Systems says it is on track to save at least $9M per year in energy costs by employing a comprehensive energy-management program in more than 1,600 of its labs worldwide.

PROJECT OVERVIEW

When Cisco sought to reduce its energy consumption and costs, its labs were an obvious target: they account for 60% of the company's total power use yet occupy only about 10% of its real-estate space: collectively the labs represent more than 2.3M sq ft or about 213,677 sq m. The labs, which are used to develop and test products and for customer support and sales, consume in excess 900MWh of power a year and have a combined annual electricity bill of more than $80M. They are Cisco's single largest source of operational greenhouse gas (GHG) emissions.

Cisco's labs are similar to data centers in that they are dynamic IT environments with variable power and cooling requirements. Located around the globe, the labs range in size from 1,000–20,000 sq ft (about 93–1,858 to sq m) and in complexity from several racks to full-blown R&D, test, sales and service labs with hundreds of racks.

To reduce lab electricity consumption, Cisco began a two-year initiative in late 2011, which will be complete by July 2013. Before the project was approved, an initial return on investment (ROI) calculation projected a two-year payback period. There was an allocated energy-management program budget, but individual lab projects had to demonstrate a payback threshold.

The program is part of Cisco's broader environmental sustainability commitment, which is to reduce its GHG emissions by 2012 from a 2007 baseline (the company is in the process of updating its commitment for 2013 and beyond). The overall lab initiative had three broad components: technology, infrastructure and people.

TECHNOLOGY

The largest savings were from deploying smart power distribution units (PDUs) in all new labs and in major lab retrofits, as well as in existing labs (priority was determined based on ROI thresholds). Smart PDUs enable automatic and remote control of lab equipment, which is important as much of the lab equipment does not need to be constantly on. The amount of power that the smart PDUs have saved in each lab varies considerably, from 5–60%, depending on the lab. Cisco says 11,000 smart PDUs will be installed by July 2013 and will result in at least $8.6M in annual electricity-bill savings. It purchased PDUs that were compatible with Cisco's EnergyWise infrastructure, which Cisco said removed barriers to adoption. EnergyWise is Cisco's networking technology to power monitor and manage a range of IP-connected devices.

Cisco also developed and deployed automated shutdown scripts to turn off lab Environmental Design Verification Test (EDVT) chambers, which historically were never turned off. This initiative has achieved additional savings of more than $250,000. Finally, Cisco documented all of the energy used by the labs globally and stored the

PROJECT AT-A-GLANCE

- Cisco sought to reduce power consumption at its test and development labs, which are dynamic IT environments with variable power and cooling requirements
- The labs consume about 60% (>900 MWh) of the company's total power use and have a combined electricity bill of more than $80M annually
- Cisco's global energy-management initiative focused on low-cost projects and employee engagement (>40,000 lab employees)

PROJECT ACHIEVEMENTS

The project will save at least $9M annually in electricity costs using proven technologies and strategies

The largest portion of total savings will be from deploying about 11,000 smart PDUs for annual electricity savings of at least $8.6M

Other energy-saving tactics focused on cooling and airflow improvements

data in a central repository, which also included technical resources such as tools, applications and guides.

INFRASTRUCTURE

To identify savings, Cisco conducted energy audits for selected labs with a focus on airflow. No-cost and low-cost efficiency projects (e.g., layout changes to improve airflow) were executed first.

A total of 19 infrastructure projects have been funded to date, and they are projected to collectively save $564,000 in annual energy costs. They include:

- installing variable frequency drives (VFDs) on cooling systems
- upgrading chiller compression controls
- installing dry cooler systems
- adjusting lab equipment layout and set points
- installing diffusers and blanking panels
- optimizing airflow by moving floor tiles and employing hot-aisle and cold-aisle containment.

PEOPLE POWER

The initiative required broad support from many stakeholders: about 40,000 employees operate the labs. Cisco employed different strategies to engage its workers, including communication, education, rewards and recognition. Specific employee engagement tools and tactics included:

- requiring lab shutdowns during the company's 11-day, end-of-year holiday period, saving $1.1M (10.5M kWh)
- instituting an "energy champion" program, in which 80 people across various labs were designated change agents
- installing digital signage in the 240 top energy-consuming labs to show progress and to display pertinent (and sometimes quirky) energy-saving facts
- crowdsourcing energy-saving ideas via WebEx Social
- setting individual and lab performance goals
- rewarding and recognizing energy savers with gift cards, bonuses and mountain bikes (rewards were commensurate with savings).

Cisco says the program is on track to reach, or even exceed, its ROI and GHG emission-reduction targets, and to save at least $9M annually in electricity costs. The lab program also has provided other organizations within Cisco with a blueprint for implementing energy-saving programs.

ABOUT CISCO SYSTEMS

Cisco is the worldwide leader in networking that transforms how people connect, communicate and collaborate. We design, manufacture and sell Internet Protocol ("IP") based networking and other products related to the communications and information technology ("IT") industry and provide services associated with these products and their use.

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