

## Hot and cold running savings

How Tektronix discovered \$510K in utility savings in three days

### Application Note

#### Top areas of saving

- Shut down boiler in summer
- Forego summer lawn watering
- Turn off fountain
- Reset chilled water to 45 °F
- Power down PCs during off hours

with a one-time investment of \$233K. \$378K of that annual amount is possible in 2009.

"We followed the audit process, which breaks down all the different utilities, and we focused in from there," Ohama says. "It's a matter of looking at things on paper and going out into the plant. It's a top down/bottom up approach."

#### Where they looked

This wasn't Tektronix's first energy audit, so some easy areas of improvement that many companies find had already been taken care of.

"One of the biggest things typically is lighting. We had done a lot of lighting retrofits some time ago, so we didn't find as much opportunity there." Even so, by updating a few parts of their lighting management system and changing the settings, they still managed to identify an additional \$30K in annual savings.

Where they did find substantial savings was in their hot and chilled water systems.

"We're looking at actually shutting down the boilers in

#### Testing Functions Case Study

When Tektronix, a \$1.1 billion global leader in test, measurement and monitoring instrumentation, scheduled a three-day energy audit, Facilities and General Services Manager Joe Ohama was pretty sure his groups would find opportunities to save money. But he was surprised where they found them. After participating in an energy audit at a sister company that uncovered \$365K in potential savings from energy conservation and waste management improvements, Ohama moved fast to schedule the Tektronix audit.

"I looked at what it took to do the 'kaizen,'" Ohama said. "I had pretty much what I needed to do this in-house and with Linc Facility Services, our facility maintenance provider."

Tektronix had already been approached by Portland General, its local utility, which was pulling together an Industrial Energy Initiative through the Energy Trust of Oregon, led by Strategic Energy Group. The goal was to encourage 12 Oregon companies to come together to share best practices related to industrial energy usage. Ohama invited the group to be part of the audit team, along with campus tenants.

In all, about 25 people assembled in Beaverton, Oregon, for the three-day exercise. The group divided into two teams—one to focus on electrical usage, one charged with analyzing natural gas, water, waste and everything else.

Using a corporate energy audit system for consistency, 72 hours later they had identified \$510K in estimated annual savings,



**Tools:** 289 DMM, 971 Temperature Humidity Meter and 1735 Three-Phase Power Logger

**Operator:** Joe Ohama, Facilities General Services Manager, Tektronix

**Measurements:** Power consumption and voltage logging over time, temperature/humidity checks, thermal inspections



The Tektronix team spanned Manufacturing, Facilities, Engineering, and Linc Facility Services. Pictured here are Jim Hoak, Lonnie Rudick, Bart Welling, Stan Maier, George Portwood, Marco Serell, Blaine Rogers, Mike Flynn, Dermot Houston, and Joe Ohama. Not pictured: Ted Beldon and Steve Hancock.

the summertime," Ohama says. "We have always run boilers and chillers 24/7. Now we're doing some modifications that will allow us to shut the boilers down in certain months, saving natural gas." Instead of keeping the plant's boilers fired up, Ohama's group plans to switch to localized hot water tank systems capable of running targeted smaller applications. Annual savings—\$133K

"One of the biggest audit findings was the benefit of pulling in people from our different user groups," he says. "Manufacturing, engineering—getting everyone in the room at the same time. For example, we've always run compressed air at 110 pounds. We thought our users needed that much. But our users said, 'We really only need 100 pounds.' Annual savings—\$7K. We did the same thing with chilled water for environmental and machinery cooling, going from 43.5 °F to 45 °F." Annual savings—\$20K.

No area was overlooked. Foregoing the company's fountain saves \$45K; not watering the grass in the summer saves \$48K. Optimizing and calibrating air handlers garners \$9K; resizing the exhaust fan saves \$15K, replacing cafeteria spray nozzles saves \$2K.

## How they did it

If many of Ohama's biggest savings came from comparing supply vs. demand, many other incremental savings came from tried-and-true best practices.

- Ohama tracks power consumption by building per day and tracks consumption on specific loads with individual power loggers. This both identifies and confirms energy savings.
  - In particular, the teams identified an opportunity to reduce kWh used by the cooling tower, by adding a VFD. The VFD will drive the cooling towers in accordance with load demand, at an annual savings of \$39K.
  - Running a power logger on the air compressor mentioned above allowed the team to calculate how much they would save from a 10-pound compression reduction.
  - The team surveyed kWh consumption at multiple motors and VFDs and calculated ROI gains from modulating operation, instead of running at 100 %.
- Identifying new opportunities to optimize air handlers. By incorporating some new tuning procedures into the existing preventive maintenance schedule and evaluating the percentage of outside air being conditioned, Ohama's team hopes to save an additional \$18K annually.
- The team will also optimize the Central Plant Operations (CPO) chiller, saving \$2.6K. To do this, the team increased parameters on the chiller controls, so they could stage down to the small chiller and still carry the load at 45 degrees.

They'll stay this course until the chilled water flow demand increases in the summer.

- Using thermal imagers, the team surveyed their buildings for thermal loss, air leaks, and vent leaks, turning up \$3k of annual savings opportunities.
- They also used thermal imagers to scan electrical panels, looking for hot spots that could indicate high resistance or connector malfunctions that manifest as wasted heat energy.
- This summer the team is considering raising indoor building temperatures from the previous standard 72 °F to a higher 77 °F. Doing this will require resetting building temperature sensors and controls, using the building management system, and conducting ambient air temperature measurements.

## Off and running

Tektronix Chief Financial Officer Chuck McLaughlin was pleased with the results of the energy audit. "Joe and the team took the time to set themselves up for success, brought the right people together and asked the tough questions. Their results will serve as a great stretch goal for other companies as the energy audits continue."

Identifying \$510K of estimated annual savings is a solid accomplishment for three days of focus. But Ohama's work isn't done. In the coming months, Ohama will be helping other companies run similar energy audits. Who knows what they'll find—or where they'll find it.

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