

## The Energy Savings Treasure Hunt

Todd Bell

Searching high and low for energy pirates

Recently, I saw something during a site-energy audit that made me react with, “What the...?! Is that what I think it is? Holy heat lamp, Batman!”

Now, what in the world could possibly make me, a seasoned site-energy analyst, react with such unbridled amusement?

I was in central California during the dog days of summer, and inside the walk-in freezer, I found a 250-watt heat lamp blazing away! You can imagine the back story: The regular light bulb burned out and, in a panic, someone grabbed the first thing they found and screwed it into the socket. I showed the manager my find and quickly realized, by his unfazed reaction, that he was probably the guy who made this unwise decision.

That’s the nature of kitchen operations: In a pinch, even a bad fix can look sensible. Unfortunately, improvised solutions and deferred maintenance are standard practice in our industry. In the heat of battle, we’ll do almost anything to keep the machinery moving.

I’ve been a commercial foodservice energy auditor for the last decade, and I’m still amazed at how much energy waste I find. There is something obviously wasteful in just about every site I visit—big or small. Every visit is like a treasure hunt. When I find gems, like the heat lamp in the freezer, I always take note and share with other managers, owners and facility folks, because these “energy leaks” cost American restaurateurs and operators millions of dollars every year. I’d like to share a few of these gems with you; but let’s start with a little saying that you, as facility maintenance professionals, might share with your managers and kitchen staff: “If it looks wasteful, it is!”

### Hunting for Energy Savings

Let’s get back to that 250-watt heat lamp. Without accounting for the additional heat load on the refrigeration system, that single lamp, burning 24/7/365, has an annual operating cost of almost \$400 at California electricity rates. I recommended that they remove the heat lamp and replace it with an efficient, long-life 14-watt LED lamp. That saved them about \$350 a year, and ROI on the cost of the LED lamp was about 20 days.

Sure, I’ve only ever found one heat lamp in a freezer, but I find 60- to 100-watt incandescent lamps all the time. At the average national electricity rate of \$0.11/kWh, a 100-watt incandescent burning 20 hours a day will cost you about \$80 a year, and a 14-watt LED will cost about \$11. Those incandescent lamps look awfully wasteful.

If there is one thing I’ve learned over the years: Never leave a stone unturned, rooftop unscaled, mechanical closet unopened or evaporator coil uninspected. There is a treasure trove of energy and water waste in out-of-sight, out-of-mind places like mechanical rooms, roofs, basements, the hidden crevices of the dishroom and the spaces underneath countertops. A regular look into these spaces can save an operator hundreds of utility dollars per year.

For example: the dishmachine booster heater with a leaking temperature pressure relief (TPR) valve that I found stashed away in the water heater closet. (The mineral-deposit build-up looked like a cave formation—a sure sign that it had been leaking for a long time.) This 60 gallon-a-day, 180-degree Fahrenheit leak was costing the restaurant \$570 a year! I see enough TPR leaks on booster heaters and water heaters that I suggest you add that to your own maintenance check list. Sometimes energy/water wasters, like TPR valves, are not as obvious because they leak right into the floor drain. That’s why I consider them to be “hidden treasure.”

Next to the leaky booster heater was the recirculation pump for the hot water line. This pump was running 24 hours a day through mostly uninsulated pipes. Bare copper pipes are a red flag for me: a path to surefire heat loss and energy waste. Recirculating hot water through uninsulated pipes just makes matters worse.

One of our Food Service Technology Center studies delivered an \$800-a-year cost savings by placing the “recirc” pump on a simple timer and turning it off when the kitchen was closed. More sophisticated pumps may have integrated timers, but all too often, I find that they are not properly commissioned and have been left in the constant “on” position. That’s a “hidden treasure” with an easy fix and, while you are at it, be sure to insulate those bare hot water lines above your ceiling tiles. High-quality 1-inch pipe insulation is a cheap way to increase the efficiency of your hot water system. Last but not least, “recommission” the water heater, e.g., reset the temperature, to match your sanitation requirements; there’s no need to make more hot water than you need. When I find 180-degree water recirculating 24 hours a day through uninsulated pipes, I’m instantly reminded of that heat lamp in the freezer.

### The Importance of Regular Maintenance

Many years ago, we discovered that a low-flow pre-rinse spray valve (PRSV) is about the most cost-effective way to save energy and water in a restaurant. We shared that with the food-service industry, and they are now pretty standard everywhere. But, these simple devices require maintenance, too. I routinely find faceplates that have shifted, orifices drilled out or handles wrapped with plastic wrap to control leaks because the gasket has split. A seemingly small half-gallon increase in flow-rate can result in a \$200 annual operating cost increase.

When those guys go bad—and they will eventually wear out—just get a new one. They only cost about \$50. Please don’t let anyone drill out the orifice! I have a collection of drilled out PRSVs I have retrieved from the field and most of the time the “drill-mod” has doubled the water use.

A water valve leak at the three-compartment sink is very visible and easy to measure, and hopefully it drives some immediate action to repair. But, I love the energy wasters that are buried deep in the sand, behind protective screens and in silver boxes that don’t exactly attract routine scrutiny. That’s why, with a screwdriver and an extension mirror in hand, I dig deep and inspect every condenser coil and walk-in evaporator coil I can.

Manufacturers commonly place stickers on reach-in refrigerators and freezers advising owners to clean condenser coils frequently. But I find lots of dirty coils. Food Service Technology Center studies prove that you should listen to those manufacturers’ recommendations. A clogged coil can and will increase a refrigeration system’s energy use by 50 to 100 percent.

Now consider a typical ENERGY STAR-rated, single, solid-door freezer. If it’s out-of-the-box new, its annual operating cost is \$370. Foul the condenser coils with dust and lint and that will easily increase by \$100 per year, while also shortening the compressor’s lifespan. We believe in clean coils so much that we give out extension mirrors and coil brushes at our utility booth during the annual RFMA show. (Stop by and see for yourself!)

### Knowing When to Upgrade

If I’ve planned my kitchen expedition right, I’ll warm up by the hot line after checking out the evaporator coil in the walk-in freezer. Here, I’m most likely to find the broiler working at full tilt well before the customers have arrived and, nearby, its fellow energy-pirate: the low-cost, low-efficiency, 14-inch fryer. While the broiler scheduling is an ops issue, replacing the low-efficiency fryer with a high-efficiency ENERGY STAR model is now easy and very cost effective due to the introduction of value-priced models from two major manufacturers.

With price points at about \$1,500 (and a California Energy Wise rebate of \$749), it makes more sense to retire the low efficiency unit outright than to re-weld the fry vat again or replace the pilot/igniter assembly. With their 50-percent cooking energy efficiency and low-idle energy rates, these affordable fryers deliver, on average, \$500 annual energy cost savings, faster cook times and extended oil life. A lot of my auditing involves sleuthing out hidden gems, but retiring the low-cost low efficiency fryer is a pile of gold hidden in plain sight.

### A Gradual Shift

As my auditor’s odyssey continues into its second decade, there are sure to be many more discoveries of the same energy and water leaks I see time and time again, as well some I have never seen before. But, I am encouraged by what I am already starting to find more regularly, such as ENERGY STAR- and California Energy Wise-qualified cooking appliances and refrigeration equipment on hot lines and in the back of the house.

I have a blast digging up energy/water waste and sharing the results, but the real gems in my world are the operators who are making efficient equipment their standard spec and implementing disciplined maintenance schedules for each energy- and waterusing system. They recognize that preventive maintenance and efficient equipment pay for themselves with reduced cost of ownership, increased performance and extended service life. So in closing, I look forward to saying more often, “Holy LED, Batman!”

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