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Low-Cost Energy-Conservation Measures

By Richard G. Lubinski

Welcome to 2009 – with a recession, a federal government stimulus package, reductions in capital budgets, *and* increases in utility costs. While this may not be the perfect storm, it will certainly be an interesting, challenging year. We can pull the covers over our heads and hope for good news, or we can get back to basics and do something about our energy consumption.

In regulated and deregulated markets, electricity costs have increased considerably in recent years. This trend is likely to continue in spite of the recent fall in natural gas cost due to market trading linkages to crude oil prices. While the supply-side energy-management options are limited, the demand-side energy-management opportunities represent a potential gold mine. We need to refocus our efforts in times of little or no capital dollars on operational savings or low-/no-cost energy-conservation measures (ECMs).

Strength in Numbers

You need monthly energy-consumption data in order to understand your building and track the results of energy-savings improvements. Your accounting records only focus on utility costs and payments, and not on the energy consumption that your utility bills are based upon. A simple utility accounting system is needed to intelligently begin any energy-management program. You can collect the data from your utility bills for the past year and enter the information into a spreadsheet. An easier way is to use the utility company's records to quickly collect 12 to 24 months' worth of utility consumption for electricity, natural gas, district chilled water, district steam or hot water, and water consumption. Since the utility records are already in electronic form, you might be able to collect the data electronically by asking the utility's customer-service department or representative to export the data to Microsoft Excel, and then e-mail it to you. Getting the utility-consumption histories from screenshots or via fax is much better than waiting a week (or even up to a month) for the information to arrive by snail mail.

Once the data is collected, you can format it to have a monthly view of your building's energy consumption over the past few years. While the data can be affected by occupancy, work schedules, and heating/ cooling degree days, the simple approach is to ignore these factors and only look at the big picture and trends. It's a bonus if the same format is used to track utility costs over the same period and additionally calculate monthly average unit cost for the utilities purchased.

Level One Energy Audit

A local Certified Energy Manager (CEM) could be hired to conduct a moderate cost review of your energy-consumption history, HVAC, lighting, energy-management /building-automation systems, and human-behavior-related control issues. An independent, third-party consultant can review your building without preconceived notions and see things with a fresh set of eyes, *without* any hidden agendas. Monitoring your building with data loggers, EMS logs, and utility interval data will uncover what happens in your building across a week or two. This high-level look at your building's operations will reveal what happens – 24/7 – during this period.

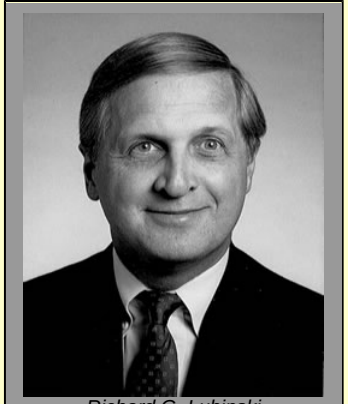
There's an immediate return on investment (ROI) when you can adjust building controls and/or people's habits to reduce energy consumption. A Level 1 energy audit may find one dozen to five dozen EMCs that will reduce energy consumption with little or no capital investment. The key to this process is controlling what you own vs. making capital investments in new high-efficiency equipment. This process may be

able to reduce your building's energy consumption and costs by 5 percent, up to as high as 10 percent in a few cases.

The facility's automatic controls and operational processes could be a gold mine where you can find, pick up, and save real money for your building. A building with lower energy costs becomes more profitable (and also gains in asset value). The beauty of this process is that it can be done with little or no capital investment.

Energy agencies and websites often have free tips on low-/no-cost ECMs for certain types of buildings and businesses. These can become checklists of things to look for within your building.

It's a good idea to start with the biggest energy users and then proceed to smaller energy users. Time spent reviewing the control over central heating, air-conditioning, air-handling units, pumps, ventilation (intake and exhaust), and water heating should provide energy-savings opportunities. If the energy-management system (EMS), building-automation system (BAS) time clocks, and standard controls were set correctly, your energy consumption would be lower. Often, the engineer's design intent is not followed by the installers or the people who operate the building. Simply returning HVAC and lighting controls to the fully automatic mode can provide immediate cost savings.



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Data loggers and an impromptu afterhours building tour can reveal commonsense ECMs. You may be surprised about what the cleaning contractor and security professionals do (or don't do) each night. While advanced controls and high efficiency can be useful, there's nothing better than a simple on/off control light switch.

Energy consumption is a matter of rate multiplied by time. If you can reduce the rate of consumption, you reduce the monthly energy consumption. In the real world, it's often easier to affect the time factor by running equipment on the correct schedules to meet the building's current needs. While the schedule of the building will vary over time, the building's EMS/BAS controls tend to get set by the building operators to meet the worst-case scenario. In many cases, the worst cases need no longer exist, so adjusting the equipment runtime schedule can reduce energy cost without any tradeoffs in occupant comfort.

Some buildings have special tenants who demand everything, and want it all the time. While

everyone wants to be thought of as special, you can't run major buildings solely to keep a few squeaky wheels happy. The application of submetering and billing for special tenant requirements (beyond the terms of the lease) often results in attitude adjustments or at least a more cooperative working arrangement.

A Level 1 energy audit can be a useful tool for the real estate manager and his/her director of engineering. The key to success is to track the energy consumption monthly and compare the data to the same prior period (e.g. February 2009 vs. February 2008, etc.). Another common expression: "You can't manage what you don't measure." Let your utility-consumption numbers guide your process and, more importantly, serve as a means to track results. Since companies and buildings are run by teams, it's important to share the energy-consumption data with all stakeholders. If the numbers go down, you're clearly making real progress. If the numbers go up, then you're challenged to find out why.

The utility-consumption spreadsheet (or database) becomes more meaningful if it contains all the data. It's important to find out if your electricity bill was estimated in February 2008, or if it covered 40 days and not just the assumed 30-day period. Tracking the consumption numbers, number of days in the billing period, actual or estimate readings, and other information on the actual bills can *very* valuable. If a meter reading or estimate is an error, it's easy to see it. Now, the simple spreadsheet becomes a useful and important management tool, and something you will wonder how you ever got along without. After all, knowledge *is* power.

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