

## Give Your Electricity Bill a Really Close Shave

Up to 72% of the electricity generated by U.S. power plants goes to keeping our buildings running, according to the Department of Energy (Energy Information Administration). Energy probably is a significant line item in your budget, if you are a building owner (or your clients' expenses, if you work for building owners). And it's likely to increase over time.

New and developing technologies, such as those promised by those working on The Smart Grid, offer promise for future energy reductions. You certainly can wait for those to become available.

But you might well ask, what can you do today? **Plenty!** In cutting your electricity use, you'll also help limit the need for new generating plants; your efforts will provide economic and environmental benefits in which we all will share.

But "the bottom line" here is yours. Shave your electricity bill today, and you'll reduce your outgoing monthly cash. The closer the shave, the more you'll save.

Strategies for cutting your electricity costs break down into two major categories:

- Reducing how much electricity you use; and
- Taking a look at when, exactly, you use it.

### **Profitable Reading: Your Electricity Bill**

A brief primer on how your utility determines your monthly electricity bill can help explain this two-pronged approach. In addition to the total amount of electricity you use—expressed in kilowatt-hours, or kWh—electric bills for commercial customers also include a **demand charge** (often shown as a dollar figure per kW); and, possibly, a **power-factor charge**.

Of the "other" charges, the demand charge is more important for most customers (power factor is more typically an issue for larger industrial users).

**Why does the demand charge even exist?** Utilities must have enough electricity available to meet all power needs. That means the local power company must be able to "scale up" to a higher local demand level, even if that demand peak occurs for a few days each summer.



## What About ‘The Smart Grid?’

Better communications capabilities are at the heart of efforts to improve the intelligence of our electrical transmission and distribution systems. For building owners, this will mean clearer insight into their facility’s electricity usage and greater control over individual systems and devices.

Such a smarter grid will make utility demand response programs (offered to building owners in most areas) easier to implement. Owners will find it easier to cut their electricity expenses. Eventually, utilities will be able to automatically adjust customers’ HVAC temperature settings and turn down lighting systems during peak-demand periods.

Third-party manufacturers already are introducing thermostats compatible with utility smart-meter signals, many suitable for small-scale, single-zone applications. The devices’ screen displays can provide real-time data on current utility kilowatt-hour pricing and enable direct utility load control, where such programs are available.

Electricity generating stations used to meet high demand (called “peaking” power plants) are, typically, the least efficient and most expensive to operate. The demand charge helps pay that added cost—and also gives utility customers strong incentive to lower their usage spikes.

*Read your bill:* The demand charge can be significantly higher than the usage portion of your bill—and even if it isn’t, it can be a big contributor to the bill’s total.

### How Your Demand Charge Works

How does the utility determine what to charge you for demand? Typically, it is based on the amount of electricity you draw from the grid during your peak 15 minutes of use during the previous 12-month period. Usually, this is a “sliding” 15-minute window . . . which means it can be ANY 15-minute period . . . any day of the month . . . any time of the day . . . during the previous 365 days!

*[Why use the words “typically” and “usually?” There is no national standard—each local utility has its own “tariff” system. And: There are 51 local electricity regulators.]*

Your high 15-minute demand over the previous 12 months is multiplied by the utility’s posted demand rate to come up with the monthly demand charge on your bill. If your peak this month is higher, you’ve thereby established a new “demand” peak . . . and a new demand charge from the power company . . . even higher than it was last month.

What happens if this month’s peak demand is lower? No matter. The peak demand over the previous 12 months remains in place, and you’re charged for that!

*[None of the foregoing is accusatory. The nation’s power companies operate this way; it’s neither illegal, nor immoral, nor “wrong.” To understand why minimizing your peak demand is important, however, you need to completely com-*

*prehend how you are charged (besides the per-kWh usage charge).]*

### Taking Your Demand Peak Down

Taking a look at when your peak demand occurs can suggest ways for reducing your annual demand charge. If your bill doesn’t provide this information, a conversation with your utility customer-service representative can help you determine when your facility’s peaks occur.

Summer afternoons, when temperatures and air-conditioning use are both at their highest, can be one obvious peak-demand period. What can you do as outdoor temperatures climb?

- Set your thermostat up during your highest-use periods. Even a few degrees can reduce demand enough to make a difference. Recent studies show that building occupants might notice when the building temperature hits 85 degrees (F), but they don’t necessarily notice a shift up from 72 to 75.

- Use translucent window coverings that cut solar heat gain while still allowing illuminating daylight into your offices

- Pre-cool your interior space by starting up the cooling system an hour before start time. It takes less energy to cool interiors when exterior temperatures are cooler, and you won't use as much energy to maintain comfort once the building is cooled

Unfortunately, your task might not be all that easy. Electricity peaks—usage spikes—can occur during other times of the year. For example, many facilities experience peak demand first thing in the morning, as building systems are powered up and equipment motors begin operating.

*Why this happens:* Motors consume more energy when starting up than they do at steady state, so starting up all motors at once—and this includes the motors driving cooling-system fans and condensers—can create a budget-busting peak. Instead, try starting up systems gradually to keep demand from spiking dramatically.

Similar savings could be gained by staggering your employees' start times. If most of your workers walk in the door, turn on their lights and fire up their computers (and room heaters or AC units) during the same 30-minute period, you well might have a demand spike on your hands. Allowing workers to choose to start and end their days earlier or later will help even out your start-up demand and could provide employees with some much-appreciated schedule flexibility.

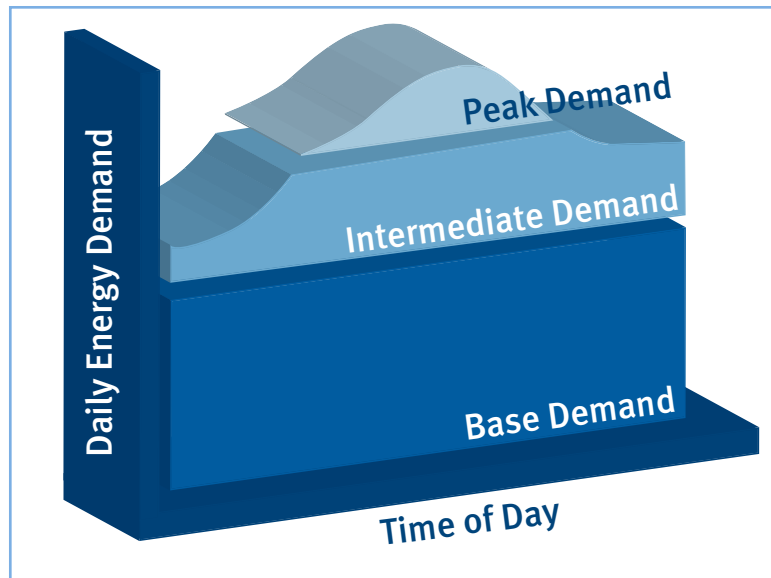
## Attacking Your Electricity Usage

Reducing your total electricity usage (the per-kWh side of the bill) requires the same mix of common sense and out-of-the-box thinking needed to bring your peak demand down. Adopting the cooling tips mentioned above and investigating other ways for using natural sunlight for illumination are common options for efficiency-conscious building owners.

Installing more efficient lighting also can have a significant impact on your electricity use, with savings that can lead to a rapid payback on your investment. In fact, a lighting upgrade may be in your facility's future, whether you're planning for it or not.

**Bye-bye, magnetic ballasts:** As of July 1, 2010, U.S. Dept. of Energy regulations will prohibit manufacturers from producing most magnetic ballasts for T12 fluorescent fixtures (although the lamps will still be available). Options include replacing the magnetic ballasts with electronic devices, modifying the fixtures to accept T8 lamps and electronic ballasts, or replacing the fixtures entirely. If your facility uses T12 fixtures with magnetic ballasts, this might be good time to rethink your lighting plan to incorporate daylight and occupancy sensors, along with dimmable fixtures.

Your electrical contractor can help you understand the pros and cons of such a move and point you toward possible rebate and tax-credit information.



## Changing the Way You Do Things

Operational changes also could have an impact on your facility's electricity bill. Some owners are reconsidering the typical practice of cleaning offices at night, a dramatic break with the past. Under a traditional approach, a building's lighting, heating and cooling all have to stay on, so cleaners can do their jobs; the building's occupants have gone home. The alternative is to bring cleaners in during the workday, when the workers may cause some minimal disruption. However, this helps ensure that the light switch flipped off at 5 p.m. will stay off until the start of the next work day . . . or, if it's turned off on a Friday, that it remains off until Monday morning.

Managers at the U.S. EPA's Denver headquarters opted for a daytime cleaning schedule when the building first opened its doors in 2006. Cleaners work alongside office personnel, allowing the building to be put to bed from 6 a.m. to 6 p.m. every night—a much-reduced energy usage profile for 42% of each workday.

In 2007, this practice reportedly cut energy costs by 28%; the savings were \$250,000. Additionally, cleaning employees are available when spills and other accidents occur, so messes aren't left to become bigger problems; and these workers get to enjoy evenings home with their families.

Perhaps the daytime-cleaning option just won't work for your facility; there are other ideas out there. How about programming computers to power down after hours? Ford Motor Company recently began a program to do just that in all its offices across the globe. Power settings on the organization's Windows-based machines will be centrally controlled to reduce energy waste and optimize software updates. Expected electricity bill savings: \$1.2 million annually.

## There's More—Look Around!

You don't have to stop with computers. Consider the office equipment, cell phone chargers, radios, and other devices you and your employees have plugged into electrical outlets throughout your facility—what efficiency experts call your “plug load.” *Even when not operating, many of these units continue to pull small amounts of electricity, either to power indicator lights or to enable rapid startup when called back into service.*

To make managing these loads easier, consider dedicated power strips with switches that let you turn all connected devices off at once.



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Index No. 3025134