

Lower electrical costs possible

A number of options are available to minimize electricity costs, i.e., building a substation, monitoring power usage, installing capacitors or consuming most electrical energy during off-peak hours.

By DOUG POST*

ELECTRICITY is one of the largest financial burdens plant managers face. A number of options are available to minimize these costs.

Even though your utility claims your rate structure is "set in stone," be innovative, and investigate ways to reduce costs within your rate structure; work with your utility.

One approach could involve building your own substation and purchasing electricity at a higher voltage. This often results in a simple payback of three to four years.

Many facility managers work within their rate structure to minimize their demand charge. Your rate's demand charge compensates the utility for maintaining enough infrastructure to service your peak load. It is a monthly fee based on each month's 15- or 30-minute peak load.

Steady electrical demand makes you a cost-effective client. You may be able to level off your peak demand by monitoring your power usage and shutting down non-essential loads as demand rises. Payback on simple monitoring systems is often fewer than six months.

Utilities maintain load profiles within certain upper and lower limits to ensure the stability of their system. If you are willing to risk a complete disconnect from the utility with a negotiated warning period, you may be able to reduce your electrical rate. The adjusted rates may be less than one-tenth of your current cost, and the utility rarely utilizes the option to disconnect.

You can also help your utility maintain its load profile by consuming most of your electrical energy during off-peak hours at a reduced rate. For



example, if your facility works a single shift, consider scheduling this shift during the time of day when other electrical consumers are not demanding electrical power.

Consider installing capacitors if your utility has a power-factor penalty clause in its rate structure or if you are billed based on KVA rather than kW. Installing the equipment to meet your utility's power factor minimums usually has a payback of two years or less.

Work closely with your utility to discover whether it has energy retrofit subsidy plans that help pay the capital costs of new energy-efficient equipment, such as lighting, variable-speed drives and motors.

Finally, perform a tax-site survey to determine your facility's energy tax exemption level. Depending on the state, this exemption allows processing plants to forego taxes on up to 100% of their energy costs.

On-site generation

Options are also available to minimize electrical costs or even generate a profit.

Industrial clients are utilizing on-site generation to manage their electrical costs, to increase the reliability and availability of their electrical supply and to protect the environment by saving energy and minimizing pollution. Perhaps your facility can realize these benefits by installing on-site generation or by reconfiguring existing generators.

Many facility managers are

negotiating drastically reduced energy rates with their utilities by agreeing to disconnect from the electric grid when asked. Generators are used to keep facilities running during these planned and unplanned outages. Generators can shave load peaks to reduce your demand charge, and they can generate energy to be sold back to the utility.

Often, facilities are capable of operating co-generation units that not only generate electricity but also capture waste heat.

For example, many co-generation units are powered by natural gas. The waste heat is then captured to serve the facility's hot water, process steam or drying needs.

Co-generation often has a better return on investment than "generation only" units.

If your electrical rate is 6 cents/kWh or higher, you should consider on-site generation.

It is also helpful if your utility welcomes private generation with a rate reduction. The size of your facility is usually unimportant.

Payback is usually two to four years for on-site generation. After that, the unit directly contributes to your bottom line profit.

Retrofits — allowing existing installations to capture waste heat or to sell back power to the utility — are also very feasible. Typically, payback for the necessary upgrades is about one year for generators that run 250 or more hours per year.

Having a generation plant on your facility is easier than you might

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expect. Installation causes little downtime, and maintenance is easily outsourced to vendors.

Deregulation

In most states, utility industry deregulation allows you to choose your power provider and the voltage level at which you purchase power. Both of these options provide opportunities to reduce your operating costs.

First, don't restrict yourself to a single power provider. In the past, this option could only be leveraged before a site was selected. After site selection, facility owners lost a key bargaining chip with utilities.

While this is still a key issue in site selection, utility deregulation often allows owners to evaluate several power providers at each site. This

enables you to select the provider who best meets the needs of your unique facility.

Second, be sure to consider capital and operating costs when selecting services from your utility. Many utilities provide a substation and site distribution (including 480V transformers) at no direct up-front charge to the owners.

However, the additional rate charges often associated with this approach must be considered.

A typical example is the owner who is offered a "free" utility-owned substation and "free" site electrical distribution. This usually appears quite attractive compared to purchasing and installing an electrical system costing anywhere from six to seven figures. However, savvy owners will ask their energy consultants to compare these capital savings against

the operating savings available by owning their own substation and site distribution.

After careful analysis of electrical contracts and rate structures, simple payback calculations often show two- to four-year returns for the owner who chooses to own the site electrical system.

Today's substation (high-voltage) equipment is much easier to maintain and operate than the equipment of the past. Most modern high-voltage equipment is as safe to operate and maintain as low-voltage equipment. These improvements allow you to easily take advantage of the savings available with owning your site electrical system.

In conclusion, remember to build a business partnership with the utility of your choice. The days of simply accepting a set utility rate are gone.