

# Using Standby Generators to Slash Electric Bills

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## Abstract

Upcoming deregulation in the electric utility industry has created substantial incentives for reducing power consumption during periods of system-wide peak demand. Various utility strategies attempt to reduce peak demands including interruptible rates, “peak sharing”, real-time pricing, etc. Interruptible rates are now available nearly everywhere in the country and can often result in electricity cost savings from 30 to 50%. Based on these incentives, standby generator upgrades that eliminate any inconvenience caused by the interruption pay for themselves in less than one year. In some regions, an entire standby generator package may pay for itself in less than three years.

## Utility Deregulation

The electric utility industry around the world is on the brink of deregulation. As deregulation unfolds, electricity will become a commodity product and the lowest-cost suppliers will dominate the marketplace. Providing electric power is extremely capital intensive, so a utility’s survival will depend on using assets more efficiently as rates are forced down by competition. Thus, utilities are already exploring partnerships with their larger customers who own standby (emergency) generators to provide less costly solutions for meeting peak demands. Without the protection of regulated monopolies, utilities simply cannot afford to let 15% of their total resource capacity sit idle 95% of the time (U.S. utilities currently have more than \$50 billion invested in these seldom-used “peaking” resources).

Virtually everyone involved in the electric utility industry agrees that deregulation will have a dramatic and far reaching impact on utilities and their customers during the coming years. Utilities will be forced to offer innovative electric services and find creative solutions to reduce the cost of electricity, which may have been overlooked in the past or were cost-prohibitive with previously available technologies. Deregulation will alter the electric utility landscape with the same kind of sweeping changes that have been seen in the telecommunications, airlines, and trucking industries.

Demand-Side Management (DSM) is one of the most important strategies that utilities are using to stretch their existing resources further. Major goals of demand-side management include:

- Improved operating efficiencies
- Reduced capital requirements
- Enhanced customer service

“Peak sharing” programs between utilities and their customers who own standby generators can readily achieve DSM goals, creating lasting partnerships to ensure that both sides save and both sides win! Peak sharing provides utilities with a cost-effective solution to find new sources of electricity without making huge, financially crippling capital investments in additional power plants, substations, and power lines. A portion of the utility’s savings from peak sharing programs are passed along to participating customers, creating extremely valuable long-term partnerships with the most prized market segment of any utility — large commercial and industrial customers:

Consequences of the Energy Policy Act of 1992, and anticipation of final Federal Energy Regulatory Commission rulings on open transmission access, are driving producers and consumers of electricity to steer their businesses through uncharted waters. And the stakes are high. For example, the 400,000 industrial customers served by investor-owned utilities account for 78% of the utilities’ revenues, or a \$156-billion market. The total value of the utility industry’s assets, more than \$809-billion, ranks at the top of all U.S. industries.<sup>1</sup>

## Capitalizing on Deregulation Opportunities

It is very important to note that a formal “peak sharing” program is not necessary for owners of standby generators to take advantage of utility-sponsored DSM efforts. Electric bills can also be slashed by using standby generators in conjunction with various other rate structures including interruptible rates, real-time pricing, time-of-use pricing, and coincident demand charges. Interruptible rates are now available nearly everywhere in the country, while the other rate structures are more experimental and confined to specific regions. The bottom line for companies who own expensive standby power equipment is that self-generation becomes attractive whenever the cost to purchase power exceeds the overall cost to generate equivalent power.

(Two case studies will be presented at the LONUSERS™ conference to show the huge financial benefits made possible by using standby generators together with interruptible rates.)

As far as the customer is concerned, peak sharing, real-time pricing, time-of-use pricing, coincident demand charges, and interruptible rates are all just different ways for utilities to promote load curtailment, similar to traditional peak shaving. However, peak shaving to reduce monthly demand charges is not desirable from the utility perspective because self-generation during off-peak hours results in under-utilization of utility resources and cost-shifting to other customers. In contrast, the utility directly initiates these new forms of load curtailment only when the utility’s cost of producing and delivering electricity is very high (rather than having customers use self-generation based strictly on peak demands at their own facilities). These new DSM rate options do, however, require an essential ingredient not found in traditional peak shaving: a direct communication link between utilities and their customers who own standby generators.

ENCORP has developed proprietary control modules and software that allow engine-driven and turbine-driven standby generator sets (gensets) to become a valuable part of cost-saving energy management and demand-side management solutions. Whenever expensive peak-demand power must be delivered through heavily loaded transmission and distribution lines, ENCORP’s products will automatically and transparently replace utility power with lower cost on-site power

from idle standby gensets (which, until now, were needed only as expensive “insurance policies” to protect against unpredictable power outages). The built-in LONWORKS<sup>®</sup> interface allows utilities to take control of remote utility-owned and/or customer-owned gensets (at universities, water and sewage treatment plants, airports, hospitals, manufacturing facilities, etc.), operating them to benefit both the customer and the utility.

ENCORP’s introductory products, called *empower* controls, provide a fully integrated solution for connecting multiple gensets directly together and/or directly to the utility grid (referred to as “parallel” operation). These products also provide a LONWORKS interface for remote control, metering and monitoring of power from standby gensets (or from any other source of electricity), making them ideal to serve the automation needs of both supply-side and demand-side energy management solutions. *empower* controls reduce electric bills, paying for themselves quickly by monitoring the quantity and quality of power consumed and then managing equipment operation to control how, when, and under what rate schedule electricity is purchased.

## Customer Benefits of “*empowering*” Their Standby Gensets

There are millions of commercial and industrial electricity consumers who will all be affected by utility deregulation. These companies will be forced to better understand and control their energy consumption to remain competitive, requiring comprehensive energy management equipment and services. While utilities scramble to compete in the wake of deregulation, their customers will expect lower electric bills, improved service and more reliable power. To achieve these goals, *empower* products automatically and transparently replace utility power with lower cost supply-side resources when available, and/or they implement demand-side load control strategies in response to volatile electric rates, such as real-time, time-of-use, or interruptible pricing. *empower* controls link standby gensets into energy management systems that reduce energy costs, providing a substantial return-on-investment for gensets that are often viewed as nothing more than a necessary expense to protect against unpredictable power failures. These genset upgrades also improve the reliability of emergency power systems because most gensets are not properly tested under load (which is extremely inconvenient without “soft” power transfer capabilities). Customer benefits of “*empowering*” their gensets include:

- Electric bills are reduced by turning idle standby gensets into revenue-producing assets, with a typical return-on-investment of less than one year for required upgrades (i.e., *empower* controls and paralleling switchgear)
- Emergency power system performance and reliability is greatly improved because standby gensets can be tested **simply and regularly** under real-life load conditions (with “blipless” power transfers that are completely transparent to the end-user of electricity)
- **Gensets only need to run for 250 hours per year (or less) to “generate” BIG SAVINGS in electricity costs!**

## Utility Benefits of Implementing Peak Sharing Programs

*empower* controls help provide the missing automation and communication link needed to implement cost-effective peak sharing programs between utilities and their customers who own standby gensets, offering:

- Dispatchable peak demand reduction initiated only when the utility's cost of producing and delivering electricity is very high
- Elimination of traditional peak shaving by customers who use on-site generation during off-peak hours to reduce their monthly demand charges, resulting in under-utilization of utility assets and cost-shifting to other customers
- More efficient use of existing resources, leading to improved system load factors
- Enhanced voltage stability and avoided line losses during heavy-load conditions
- Maximum use of utility or customer-owned standby capacity through safe parallel operation
- Highly sought-after "partnerships" with the most prized market segment of any utility — large commercial and industrial customers (who will, almost without exception, be the first and most vulnerable point of attack as the threat of competition becomes reality)

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<sup>1</sup> Vilma Barr, "Making Retail Wheeling Work: Stakeholders Speak Out," *Electrical World*, May 1995, p. 67.