Load Curtailment

Get Paid to Reduce Your Electric Load

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How would you like to be paid handsomely to reduce your electric load, instead of merely saving the charges seen on your tariff? Some customers are doing so, but preparation is key to avoiding problems.

WHAT DOES LOAD CURTAILMENT MEAN?

Since the summer of 1997, some utilities and Independent System Operators (ISOs) have been faced with situations where they must pay very high wholesale prices for power they need to balance supply and demand. To minimize the cost of doing so, they may request that some customers **curtail** their loads. In the past, customers did so voluntarily and were typically not paid. In many cases, the response was insufficient to bring wholesale market prices down to reasonable levels. **Note that this differs from *interruptible* electric service under which some large industrial customers were required to reduce load (in exchange for a general discount on the rest of their power) or else pay heavy fines.**

SO HOW IS THIS OF USE TO CUSTOMERS?

Seeing a potential win-win situation, some utilities and ISOs are creating or expanding "curtailable" electric rates that now pay customers $.31-$.40/kWh (**and sometimes as high as $1.00/kWh**) to avoid paying even higher wholesale prices. Such curtailments are aimed at those hours in a day when demand so closely approaches supply that there is effectively no competition among power suppliers, resulting in extraordinary wholesale pricing that could exceed $1.00/kWh (i.e., $1,000/MWh).

Customers with load management capability can realize significant savings by seeking out such curtailable rates for that portion of their load they can either briefly shut off, supply from an on-site generator, or satisfy through an alternate fuel (other than utility electricity). Since the duration of most curtailments is less than 4 hours (because very high prices typically occur only during a few hours each day), managing most curtailments should not be difficult for those who have prepared for them.

Such rates are now in effect in several Midwest states and all four of the coastal ISOs (California, New York, PJM, and New England). Organized groups of commercial and industrial customers, such as the New York Energy Buyers Forum (www.nyebf.org), have recently spearheaded them in areas with high power prices, like New York City. A good example of such a program may be found at the PJM Interconnection LLC site (www.pjm.com) by searching for "load+reduction+program" and downloading the update on that program.

WHAT UTILITIES AND CUSTOMERS NEED TO MAKE THIS WORK

A power customer must know in advance when a utility or ISO will need him to reduce load and/or turn on an on-site generator. Close (or automated) communication among the utility/ISO, the customer, and his equipment is thus essential. To verify that the customers demand has indeed dropped by the requisite amount (usually at least 100 kW), real-time monitoring by the utility through some form of automated meter reading (AMR) is also needed to verify the time, magnitude, and duration of the reduction.

Otherwise, it's impossible to determine how much to pay the customer, and if sufficient reductions are being achieved to avoid a system-wide emergency (e.g., a rolling blackout). Most small customers (i.e., less than 1 MW peak demand) lack the necessary "interval" utility metering necessary for this level of observation, but the cost to upgrade to a better meter has been dropping rapidly as deregulation in some areas has mandated better customer metering.

Customers need to examine their options for "integrated load management" and the equipment that it requires. Such options differ

from demand-side management (DSM) which typically focuses on permanent or continuous demand reduction, unrelated to market-based pricing. The concept of "integration" comes from the notion that, in order to contain peak power pricing, both supply and demand need to work together.

To make that happen while minimizing price risk, customers need four items:

1. ability to monitor their power loads in real-time

2. knowledge of which loads may be curtailed or switched to an alternative fuel and under what schedules (preferably accompanied by a tested plan covering them)

3. ability to receive and quickly process calls for curtailment

4. installed technology that allows reduction in those pre-chosen loads without causing disruptions in building services or production.

HOW TO GET STARTED

Before investing in any load-controlling equipment (e.g., upgrades to energy management systems), customers should analyze their quarter-hourly (or shorter) load profiles to get a grip on their existing load shape and how it varies in real time. To assist with load monitoring and curtailment control, several software and controls firms now offer a variety of tools. Three of the main software contenders in this area are:

- **Silicon Energy (www.siliconenergy.com)**
- **Energy Interactive (www.energyinteractive.com)**
- **Circadian Information Systems (www.circadianinfosystems.com)**

Many metering companies provide equipment for sub-metering and monitoring of curtailable loads, and most major controls firms offer a wide variety load control devices, systems, and programming.

SHOPPING LIST OF CURTAILABLE LOADS

To minimize any risk to the perceived quality of building services, following is a list of low-risk loads for potential curtailment and ways to make them happen:

- **electric cooling** (by reducing outside air, slightly raising room temperatures, switching to non-electric cooling, e.g., gas-fired, or thermal storage)

- **exterior and interior lighting** (by selective shutdowns in daylit common areas, and/or dimming where that capability exists)

- **fans** (by duty cycling among several, speed reduction, or brief shutdown)

- **elevators** (shutting down one out of a bank of several)

- **domestic hot water heaters** (lowering temperature, duty cycling among several, or switching to non-electric sources, e.g., natural gas)

- **process loads** that can be served by either a generator or an alternative fuel (e.g., a gas-fired compressor).

If on-site generation is available, it is most appropriately used when dedicated to feeding non-critical loads (e.g., pumps, fans, motors, domestic hot water heaters) but not those sensitive to brief power variations, such as computers, electroplating, or interior lighting.

IT'S YOUR MOVE

Be pro-active: call your utility to find out if a curtailable rate is available, or could be set up as a pilot program. While others may continue to see price volatility only as a source of their *problems*, here is a chance to make it a source for your *profit*.

This article appeared as one of Mr. Audin's "Tips of the Month" commentaries. More can be found at www.EnergyBuyer.org. They are brief excerpts from the Energywiz seminar "Profiting From Deregulation: Power Techniques for Power Purchasing," the only seminar focused on training customers and consultants to handle retail power procurement. For those interested in taking this course, more information is available at www.energywiz.com and www.energyseminars.com.

ABOUT THE AUTHOR

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Audin has been named Energy Manager of the Year by three different national or regional organizations, most recently by the Association of Professional Energy Managers in 1995. In 1993, the Association of Energy Engineers (AEE) named him their international Energy Manager of the Year, and in 1996 inducted him into its Energy Manager's Hall of Fame, the highest recognition in that field. His work has won many other national and regional awards, and has been featured in videos, case studies, and magazine articles.

He served on the board of the New York Designer's Lighting Forum, the *Energy User News* Technical Advisory Board, and an ASHRAE 90.1 technical committee. His column on lighting and energy issues has appeared quarterly in *Architectural Record* magazine since 1991, and his work appears frequently in energy-related publications and on such Web-based magazines as E-Source's *Power Tools.*

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