

Peak Load Management Opportunities Are Waiting

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Peak load management has been described as a killer application. Yet it has been used by too few electric utilities or their commercial and industrial customers. Utilities seem strangely paralyzed in the face of significant benefits as evidenced by the huge price increases for a few hours and days each summer. Regulators seem no better at recognizing their role in restructuring to facilitate efficient markets for all energy resources, including backup generators and other distributed resources.

SHORTAGES COMING

For two summers now, serious shortages have developed in several regions of the country. Spot prices for electricity literally skyrocketed in a vain attempt to balance supply and demand.

Wholesale rates in the Midwest normally average about \$.025 per kilowatt-hour or \$25 per megawatt-hour (MWh). During the summer of 1998, spot rates rose to about \$7,500/MWh, an amazing 300 times the average wholesale rate.

Federal officials and others received some of the blame due to an imperfect wholesale market structure. Many of these officials claimed such price spikes were a unique event associated with a transition to more competitive markets.

Their faith in markets was tested again last summer. This time spot prices reached \$9,500/MWh for a few hours in the summer of 1999, or

about 400 times the average wholesale rate. Energy suppliers defaulted on contracts including one utility for over \$70 million. Customers were forced or requested to close their operations.

Now some predict the summer of 2000 could be even worse. Prices have been forecast as high as \$12,000 to \$14,000 per MWh. An official with the East Central Area Reliability Council predicts that "...the summer of 2000 will be one of the tightest ever for electricity generation." For the nine state area served including Indiana, Kentucky, Maryland, Michigan, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia, the official warns "...the summer forecast is worse than 1999."

The largest state electricity market is not immune from the threat of inadequate capacity and high prices. California is projected to have zero reserve margins by some experts. It could be a painfully uncomfortable summer in more ways than one.

LONG-TERM PREMIUM DOLLAR SOLUTIONS

Certainly new capacity is coming on line for both generation and transmission. But it is probably too little and too late for the summer of 2000 and perhaps the next several summers. Transmission capacity has grown only by 18% over the last decade while customer end-use demand has increased by 35% according to EPRI. Demand is forecast to grow at least another 2.5% this year according to the U.S. Energy Information Agency.

Prospects for better planning between generation and transmission appear to be fading, at least in the short term, as restructuring unbundles the vertically integrated electric system. Each part of the value chain is focusing on their business proposition with limited regard for the other parts of the delivery system where utilities remain vertically integrated, and fuel adjustment clauses and demand revenue losses inhibit action.

Several independent power producers as well as utility generation companies hope to capitalize on peak power needs. Many projects have been announced, including peaking units. But as the saying goes, timing is everything. Summer is here. And even if more units come on line than anticipated this year, management of customer peak loads can be more cost-effective.

PEAK LOAD MANAGEMENT IS A BARGAIN

Opportunities exist to shave peak demands substantially. Industry expert Joel Gilbert has noted that a 5% reduction in peak demand with load management can reduce system costs by 50%. And 5% reductions in peak demand are perfectly reasonable based on the favorable experiences of several progressive utilities with load curtailment programs.

It only costs about \$60/MWh for backup generators to run. Thus, there is a great savings possible compared to \$10,000/MWh. For example, a 1,000 kW backup generator could save nearly a half million dollars just by running just fifty hours.

PEAK LOAD MANAGEMENT CAN BE EASY

Peak load management refers to reductions in customer load during periods of short capacity and high costs in the electric system. Peak load management may be achieved by customers reducing their loads voluntarily or in response to price signals and other incentives offered by the energy service provider. Peak load management by a customer may include simply reducing part of the load from the utility such as by cutting back on usage or switching to backup generation equipment. This is commonly known as curtailable load reduction.

Interruptible load reduction may also be called for. This is where there is complete load reduction, such as by shutting down facilities and production or switching completely to alternative energy sources.

A common method for curtailable load reduction is to switch load to backup generators kept ready for emergencies. Numerous large commercial and industrial facilities retain backup power generation equipment. Emergency generators are mandated at many facilities for safety reasons or kept in place for good business reasons. Such backup energy sources are frequently found among commercial energy users as:

- hospitals,
- data centers,
- high-rise buildings,
- communication centers,

- water and wastewater treatment plants,
- military facilities,
- and airports.

Even if these generators are not sufficient to carry the total load of the facility, they can carry a substantial portion of the load. Of course it is important prior to calling on such resources to be sure they can carry any load. Too often emergency generators are tested monthly to confirm availability but are not loaded to measure capability. It is similar to someone who buys a new car by turning on the engine, but not seeing how it drives.

Backup generators need not be the only resource that commercial and industrial customers have available to reduce or shift load. Other actions include:

- shutting off one of several chillers,
- increasing thermostat settings,
- controlling lights,
- closing a production line, and
- shifting production to off-peak hours.

In fact, users often have many imaginative ideas to reduce peak demands. All they need is education, encouragement and incentives from the utility.

THE DEMAND EXCHANGE

Some utilities have successfully harnessed the peak load management potential by contracting with customers to operate backup generation equipment during emergencies or when costs of supplying power are unusually high. Several utilities have been successful in avoiding the construction of entire new generating units by paying incentives to a small number of customers to operate the backup generators. Usually less than 100 hours during the course of a summer air conditioning season is all that is needed. Calling on customers to shave peak load from four to six hours for up to 15 times a summer is sufficient for a utility

to make it through peak times without paying outrageous spot market prices.

But in these days of unbundled services between generation, delivery, and marketing, a new service is necessary and has been established. The Demand Exchange, as created by Joel Gilbert of Apogee Interactive and with the cooperation of several leading utilities, will allow forward pricing. It operates through an auction process using the Internet.

Customers can look at the price forecast for the day ahead and offer to reduce their loads. If their bid for peak load reduction is accepted, the customers may typically expect to gain 50 percent of the savings or costs avoided. Bids could be accepted from a variety of participants including the generating company, distribution company, power marketer, or even another customer facing high spot market prices. Metering, verification, settlement, and credits on energy bills insure integrity and fairness.

It is not unlike the airlines, which pay people to get off when oversold. Similarly, customers are paid to reduce their load partially or totally by operating backup generators or reducing load by some bid and verified amount. The author is familiar with one of his former customers which pulled its entire telecommunications computer center of 9 MW off the utility lines when requested and operated on backup generators.

The Demand Exchange has signed up over ten utilities with over 1,200 customers for the summer of 2000. Aggregated load management potential exceeds 2,500 MW, and this is just its second year with more time to meet summer needs.

Customers want to participate and help: they have read about high spot prices in the papers and know they can help. However, incentives themselves are necessary but not sufficient to gain customer participation. Customers need to be educated and serviced to encourage such unfamiliar actions.

OTHER ACTIONS NOTWITHSTANDING

Other market-based solutions exist but are not really that promising. Many utilities have adopted interruptible programs. But they historically have been for economic development, and customers become indignant when called upon to shut down operations without much notice.

Real time pricing is considered another solution. But when a customer pays the equivalent of 100 or more times the average energy price, attrition from such programs will be high, unless caps are built in and the supplier assumes more of the risk.

Thus peak load curtailment is one of the most viable options available for this summer and indeed during any peak period. The customer is paid for reducing peak loads. The customer cannot be expected to do so for free. Nor does he have to. The utility can afford to pay well, since the option of paying extremely high spot market prices makes it economical to take some of the savings and work them into an agreement with the customer.

If utilities fail to act, customers may be tempted to exit the system altogether. Or they can move their industrial production to a service territory with a more progressive utility. Certainly a better option is to adopt a peak demand management program and join the Demand Exchange.

ABOUT THE AUTHOR

Larry B. Barrett is president of Barrett Consulting Associates, Inc., specializing in energy services marketing management. He consults on market assessments, marketing strategies, new product implementation, and strategic alliances. He has completed assignments for original equipment manufacturers, electric utilities, gas utilities, energy research institutes, energy management companies, telecommunications companies, oil companies, energy contractors, chain accounts, trade associations and professional associations.

Mr. Barrett established his consulting practice in 1989. Engagements have included developing a business strategy for an energy services company, designing and implementing the technical and sales programs for an energy services company, advising a telecommunications company on introducing new products to the utility metering market, and conducting marketing planning workshops to commercialize and increase new energy efficiency technologies. Other projects include managing new technology demonstration programs, planning energy services offered through the Internet, training non-technical personnel on energy end-use technologies, and advising chain accounts on energy strategy.

He is active in the Association of Energy Services Professionals,

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