



**AUTHOR**

George C. Hunt III  
*Director, Enerwise Global  
Technologies, Inc.*

**ENTERPRISE  
ENERGY MANAGEMENT:  
BEST POWER—BEST PRICING—BEST  
CONTROL**

An increasingly power-dependent economy brings about a host of new challenges to those responsible for managing energy usage and costs. Stricter requirements for power quality and reliability become the norm. Competitive pricing resulting from electricity deregulation makes energy purchasing more complicated. The need for energy intelligence, such as where and how power is used, how to manage peak demand, and methods for controlling costs, is exponentially greater.

As a result, Enterprise Energy Management (EEM) is fast becoming the solution of choice. EEM is meeting commercial and industrial (C&I) customers' demands for greater value from energy expenditures by putting into their hands a host of tools and mechanisms that help them to better understand and manage their energy usage. EEM is helping C&I customers to make the most prudent decisions about energy strategies for their organizations, and ensuring those decisions are economical. In short, EEM is providing C&I customers the best power at the best price, with the best control.

**WHAT IS ENTERPRISE ENERGY MANAGEMENT?**

EEM in its simplest form is a package of automated tools created to give energy users a thorough understanding of energy data. The best forms of EEM



are both user friendly and capable of providing real-time information so energy users can develop and implement complete energy management strategies. These strategies include:

- load management;
- quality and reliability assurance; and
- distributed generation.

Many C&I customers around the country already benefit from reduced costs and improved reliability as a result of EEM-enabled strategies. Energy providers also benefit through the creation of new revenue streams, increased efficiency and improved customer satisfaction. In both cases, the value is becoming too great to ignore.

## 2

### **EEM & TODAY'S C&I POWER USER**

Today's commercial and industrial electricity customer has greater and stricter power requirements than ever before. Energy needs have advanced beyond 'keeping the lights on' to a real necessity for an uninterrupted supply of power for equipment central to their core business operations. For example, telecom companies and Internet service providers are under pressure to deliver 100% 'uptime' to clients, requiring power reliability well beyond the 99.9% delivered by 20<sup>th</sup> century infrastructure. Today, the demands are closer to 99.99999%, a point that even is reflected in competitive advertising. Even for more traditional industrial customers like manufacturers, loss of power means slowed production and loss of revenue. In each of these settings, EEM systems continually monitor power flow and include alarming

and automation mechanisms that notify power suppliers to remotely correct errors, all in a manner transparent to the end-user.

But continuous power is often not enough. Today, power quality is increasingly vital. Nearly every company now relies on devices utilizing microprocessors. Microchips are highly sensitive to shortfalls in power quality, voltage spikes and sags, and outages. Any of these can create data loss and corruption as well as physical damage to equipment.

EEM systems have emerged as the most effective means for assuring power quality. State of the art EEM systems employ complex voltage controls that automatically manage reactive power and frequency controls that limit deviations. These not only help to ensure grid stability, but eliminate interruptions for customers. Further, EEM technologies can continually monitor power quality, capturing and analyzing incidences of shortfalls for future correction.

In addition, EEM-enabled customers are monitoring their energy usage to uncover opportunities for cost savings. EEM platforms collect and display customers' energy usage information, enabling them to conduct load analysis and comparison. The data informs customers on the best times to use energy from on-site assets, or when grid-supplied electricity is more cost-effective. These data also give the customer vital, real-time awareness of occasions when energy generated on site should be sold back into the grid. Such active management of facility energy load

enables customers to capitalize on all opportunities for cost savings and revenue generation while maintaining reliability.

### **EEM AND ENERGY SERVICE PROVIDERS**

Above all, energy service providers regard EEM as an economical means to add value for their customer relationships. In terms of quality, reliability and improved reporting, EEM is proving a key differentiator in a deregulated marketplace. But the benefits go beyond customers to general production planning, load management and pricing of energy generation and delivery. For energy providers seeking methods not only for supplying customers with data, but also for achieving new levels of control and management of electrical assets, EEM is demonstrating its worth.

4

The best EEM systems are integrated seamlessly for monitoring energy use and automating energy delivery and procurement. The higher quality of data afforded by EEM improves the accuracy of billing and benchmarking and helps drive load curtailment programs. EEM even delivers the ability to provide quality-based pricing to customers. The full capabilities of EEM tools, however, are perhaps best demonstrated when applied as a unified platform in support of distributed generation.

### ***DISTRIBUTED GENERATION***

In the face of rising demand and competitive uncertainty about deregulation, electricity providers are reluctant to make large investments in

infrastructure. Further, there are prohibitive costs associated with negotiating community and government approvals for large-scale generation and transmission development. Utilities, therefore, face mounting challenges surrounding the need to increase generation capacity. Traditional load curtailment programs alone are not enough to answer the growing demand for power.

Energy users have suffered as a result of volatile prices on the power grid, which in part results from a lack of demand-side participation in the energy procurement process. Before the proliferation of on-site generation, businesses were unable to decrease grid usage in response to real-time pricing, resulting in unnecessarily high grid load growth and inflated demand. Opportunities for savings via load curtailment were available only when power providers notified users about incentives for reduced consumption. In addition, the special rates and savings were often not based on real-time pricing, but on average monthly rates in the marketplace.

This often meant that companies were paying high prices amidst spikes in energy rates during periods they didn't actually require power from the grid. More importantly, they lacked the ability to curtail loads based on their own monitoring of energy prices. With distributed generation and EEM technology, energy users in open marketplaces like California, New York and parts of New England, can participate in the wholesale energy market as both buyers and sellers responding to price fluctuations. This benefits not

only the end-user, but also energy providers and energy consumers by connecting additional supply resources to the grid during peak periods. Potentially, it also enhances grid reliability by increasing supply in overloaded areas and augmenting minimum grid reserves while boosting the health of the grid itself by reducing “price -sensitive” demand.

### **ENVIRONMENTAL BENEFITS**

Although the installation of small, on-site generators requires fewer permit hurdles and brings reduced negative environmental impact compared with large-scale generators, for years, the management of distributed generation assets was considered too costly to be feasible. With the emergence of cost-effective automation of distributed generation assets, utilities can add generation capacity more cheaply at the source of shortfalls. Simultaneously, decreased plant size and the ability to integrate with ‘cleaner’ energy sources like fuel cell technology enable providers to deliver more environmentally friendly power to consumers.

6

### **CONCLUSION**

Enterprise energy management represents the key component to meeting the challenges of the new energy landscape. It provides an integrated solution to the strict requirements throughout the power delivery chain and helps to control the cost, quality and reliability of energy. It monitors sophisticated and disparate systems at multiple remote locations and ensures they interact seamlessly and in a way that is transparent to the end-user. And when combined with

distributed generation, it represents the most efficient, environmentally-friendly method to increase grid capacity. In all, EEM holds the key to getting the best power at the best price, with the best control.

## **CASE STUDY**

### ***PROGRESS ENERGY***

As the technology of Progress Energy's (PE) customers evolved and grew, so did demand for reliable, economically attractive sources of power for critical energy users such as large industrial companies and high-tech, research and healthcare facilities. In response, PE created the 'Premier Power Program,' a distributed generation service for commercial and industrial customers with critical energy reliability needs, offered through Progress Energy's Carolina Power & Light (CP&L) and Florida Power (FPC) utility subsidiaries.

"Electricity is not a luxury item, it's critical to our customers," said Mark Kruger, Director of Power Protection Solutions, Progress Energy. "Many factors can cause an outage—a car hitting a pole, an ice storm, a summer thunderstorm—and all could potentially leave a business that is critically dependent upon electricity without power. We were determined to find the best way to protect our customers from even minor momentary outages."

Progress Energy took on the daunting task of choosing and implementing technology that enabled load management, power quality monitoring and 24x7 control of on-site generation for what amounted to one of the largest such implementations in energy history

(14.5 MW). The company sought an outsourcing partner that could provide a robust, turnkey solution, capable of being seamlessly integrated with many disparate existing systems.

“It was critical to find the EEM provider who could furnish the most complete solution, customized to meet mission-critical power needs, to allow us to provide the entire service to our customers all for one monthly charge,” said Kruger. “Enerwise came to the table with proven products that promised to streamline the processes involved. Their implementation quickly pulled together many disparate systems and enabled us to completely manage our distributed generation resources, making the inherent mechanisms transparent to customers and easing the administration of the program.”

8

In the past, some EEM skeptics pointed to the various barriers to integration faced during on-site generation implementations of large scale. Nevertheless, Progress Energy was dedicated to putting the technology in the hands of their customers as quickly as possible, and set ambitious timelines for a project involving over a dozen locations throughout Carolina Power & Light’s and Florida Power’s territories. Despite the depth and breadth of the implementation, Enerwise was able to fully integrate in less than 120 days, including scoping the project, providing recommendations for improvements, and implementation of actual system enhancements. The depth and speed of the implementation represented a significant milestone for both the company and the industry.

“The swiftness and success of this integration speaks volumes about the scalability of EEM offerings and the feasibility of rolling out distributed generation. We were able to put our services in place at multiple sites in the Progress Energy system in a very short period of time,” said Dean Musser, Senior Vice President of Client Services for Enerwise.

The technologies integrated in the Premier Power Program serve to directly support the augmentation of reliability for customers and reduction of maintenance costs for Progress Energy. In addition to providing monitoring of facility electrical disturbances and notification if readings fall outside of tolerance specifications, these tools include advanced information evaluation tools to assist in the implementation of energy management strategies like interval metering, load aggregation, peak load analysis, trending and benchmarking, and alarming and paging. The Premier Power service provides customers with utility-owned onsite generating equipment to serve as a back-up power source if service is interrupted. It also gives CP&L and Florida Power the flexibility to dispatch generation when it economically benefits the distribution system. Enerwise technology also enables Premier Power customers to uncover revenue-generating opportunities in Progress Energy’s load curtailment programs, including access to a database of energy tariffs for use in rate modeling and comparisons.

CP&L and Florida Power works with its customers to identify needed levels of power protection. The team designs, installs, manages and maintains the systems.

CP&L and Florida Power provides all working capital for the generator installation and customers pay a single monthly fee for the service. CP&L and Florida Power also tests Premier Power generators weekly to ensure reliability.

“On-site generation is bringing Progress Energy’s C&I customers added reliability, improved power quality, opportunities for conservation and savings and even revenue generation,” added Kruger. “Progress Energy gets the benefit of increased efficiency and reduced maintenance costs while providing our customers with a truly important energy innovation. We are proud to be among the leaders in implementing EEM technology, and are delighted with the success Enerwise helped us achieve.”

10



© 2002 Enerwise Global Technologies, Inc.  
All rights reserved.

A proven leader in Enterprise Energy Management, Enerwise Global Technologies provides products and services that enable commercial and industrial enterprises to reduce cost and maximize efficiency through complete energy management solutions.