

# How Technology Is Transforming Utilities... And Helping Energy Purchasers

*Ed Falkowitz, President  
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Competition had never been an issue for utilities which, as institutions, were prototypical of the solid, slow moving bureaucracies that allowed few internal changes or outside ideas. The competition caused by impending deregulation and new technologies forced utilities to wake up and take note. Unlike the Microsoft monopoly which is on the cutting edge of progress, the utility monopolies wanted and needed "business as usual." It took courage for the few utilities which chose to take on the challenge of transforming themselves and their services to accommodate the progress of the industry.

As a rule, utilities had been businesses where union contracts were generously negotiated, employment life-time, raises steady, the administrative staffs bloated, and rate increases predictable. Yet, PG&E, a utility in the San Francisco area, began installing 100,000 CellNet electric and gas meters, and had plans to automate all 8 million meters in its territory. In an article entitled "Requiem for Meter Readers?" Jonathan Marshall reports in *The San Francisco Chronicle* that the 850 door to door meter readers will eventually lose their jobs. PG&E's Project Manager for automated meter readings, Mark Hughes, said that the utility has agreed to retrain the workers and give them first crack at new jobs.

Much has been written about deregulation and stranded assets, notably, by Brian O'Reilly in his article of September 29, 1997, "Transforming the Power Business," for *Fortune*. In many states, the issue of stranded assets is a rallying point for utilities and their stockholders who claim that the consumer for whom these assets were built should have to pay their costs. Ratepayer and consumer advocates, who choose to treat the utilities as any other business, point out that over-expansion, and more efficient producers, are the hazards of doing business. The

stockholder in a utility, like the stockholder in any other business, should have to pay for overcapacity among which are nuclear power plants, and the like. These issues could be entertaining us for years to come, but more crucial are the transformations that utilities have to undergo.

Union Electric, another CellNet client, began networking its St. Louis metro customers in March 1996. According to Union Superintendent Ray Wiesehan, "Our overall motivating factor was not to replace the meter. That was just the tip of the iceberg. We made a strategic choice to improve our operational efficiency, to add to the services we offer, gain and retain new customers." One fact is true of American consumers: Give them exceptional service, and they will remain loyal and follow that exceptional service provider forever. Stranded assets need not "stranded." They could be fully operational and cost-effective to utilities that retain their customers through excellent response, value-added services, and cost-effective energy that real-time metering technology makes possible.

Up to 1996, the utility was considered a "benevolent" monopoly, consumer oriented, concerned with environment and conservation. PSE&G's Standard Offers I and II were examples of that paradigm. A leader in the conservation effort, PSE&G offered an incentive program to encourage the installation of energy saving measures whereby the incentive is paid on a kWh time differentiated basis over a period of either five, ten, or fifteen years. Needless to say, the New Jersey Standard Offer is being curtailed, as have programs like it throughout the nation.

**As the utilities' role as sole power generator and supplier disappears, so do their incentives to conserve energy.**

PSE&G would lobby for New Jersey taxpayers to trade off 10-20% savings for \$450 million a year in air-cleanup costs if the "dirty coal-burning plants" in the Midwest and South can sell cheap power without installing emission controls. Eric Svenson, PSE&G's Manager of Environmental and Strategic Planning warned that without uniform federal standards, open competition in the sale of electric power would result in increased use of cheaper and dirtier out-of-state generating plants.<sup>1</sup> Wouldn't it make more sense to woo the customer and assure his loyalty rather than threaten him with dire consequences if he should choose to buy elsewhere?

Real-time metering technology<sup>2</sup> gives the intelligent power marketer the wherewithal to reduce energy to a tradable commodity, much

like soy beans, where Wall Street stands to make billions of dollars. A typical marketing deal was signed between Oglethorpe Power, a cooperative in Georgia, and utility LG&E; in March 1997, Oglethorpe signed a second contract with Morgan Stanley Dean Witter. Each will supply half the electricity Oglethorpe's customers consume—worth well over \$5 billion over the life of the contracts. Incidentally, Morgan Stanley won the contract over Enron, the big natural-gas company.

**Morgan buys and sells the equivalent of 20% of the world's energy products, and is likely to increase its market share.<sup>3</sup>**

Although metering has been in the marketplace forever, its sophistication and intelligence gathering capabilities have grown by leaps and bounds. Indeed, major companies such as Honeywell, Johnson Controls, Schlumberger, Landis & Staefa, Kaiser Electric, CellNet, and a relatively new entrant into this field, Comverge Technologies, previously Lucent Technologies Utility Solutions, have the capabilities for energy management for commercial and industrial complexes to whom energy usage represents 30-40% of overhead. These monitoring, control, and communications technologies companies are devoting considerable energy into refining real-time meter reading, real-time data collection, and information communication to the energy user. **Comverge's technology is typical in that it enables the user to take advantage of real-time energy procurement and pricing.**

## MORE HELP FOR THE ENERGY PURCHASER

In addition, through monitoring energy consumption to reduce or avoid peak demand and usage charges, real-time monitoring controls and two-way communication systems assist the energy purchaser in:

- Managing energy and information systems.
- Recommending plant retrofits.
- Managing other installations and their retrofits as part of optimizing the total costs.
- Installing enabling technologies.
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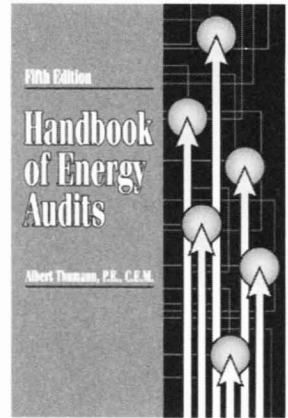
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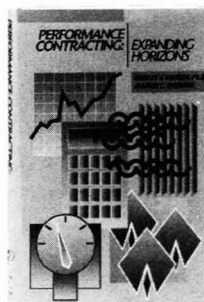
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- Generating electronic load shapes and supply side data on a daily, weekly, monthly, and annual basis.
- Suggesting ways to shape, shed, and shift loads to optimize energy savings.
- Obtaining better priced electric contracts.

The price of the technology, the hardware and installation are mitigated by the increased savings and efficiency. In addition, the plant could harness the power of the Internet to obtain and analyze pricing information for volume purchase of energy, for specific demand periods. The technology will distribute cogeneration, switch fuel systems, and deal collectively with restructuring and global climate change issues.

Some representatives of the utility industry feel that real-time monitoring technology is far too expensive to be viable. One must remember that the technology is not just a meter, which can be installed for less than \$500. Installation also means ancillary computer and information gathering investments. One utility source estimates the cost of such a complex system at \$60 billion nationwide, and \$200 million in New Jersey alone, and that this capital expenditure will never be tolerated by the energy user in an environment of competition.

**But what if the monitoring technology companies bear the risk of the investment in return for a percentage of savings on a performance contract basis, and the value-added services sold to the energy consumer?**

Honeywell, for example, has developed RTP (Real-Time Pricing) software which can match the customer's load profile with the supplier's pricing profile on a real-time, and transient savings opportunity, rather than on preselected, low priority loads. The technology can facilitate:

- HVAC load shedding (chillers, thermal energy storage, fans/pump motors)
- Non-process industrial load shedding (compressors, battery chargers, dust collectors)
- Load deferral (precooling, thermal storage)
- Fuel shifting (gas, oil, steam, stand-by generator)

The technology promises an automated response and involves the installation of an XBS panel and training people to dial in to get the savings. The software is available to owners of Honeywell building management systems, including the Excel 5000™. The success of the Honeywell technology has been demonstrated at the New York City Marriott Marquis Hotel which installed RTP software and saved \$300,000 during the first 25 months of operations. The software paid for itself out of incremental savings in only a few months.

One of the components which is required for Real-Time Pricing application is continuous demand metering of the whole building along with the individual loads which can potentially be shed during peak load times. The demand load for these items can then be input into a building controller which may then use real-time pricing signals from the utility to shed certain loads. The controller can then confirm the load reduction by verifying that the whole building load is being maintained at or below the desired threshold for each pricing level.

Honeywell DMC Services, Inc. which is a wholly owned subsidiary of Honeywell, Inc. has more than six years experience in metering energy conservation measures (ECMs) which were retrofit under various Demand Side Management programs offered by utilities throughout the Northeastern US. According to Charlie Garrison, DMC Services has installed over 1,000 demand meters and 13,000 run time meters at 1,200 customer sites. This type of equipment provides the input signals to a building controller as described above.

The ECMs which DMC Services has metered include central plant chillers, roof top package units, heat pumps, motors, variable speed drives and lighting. Mr. Garrison points out that although the real time pricing technology may not be cost effective to all customers, many would benefit from the technology along with a sound control strategy of the building mechanical systems.

Landis & Staefa's Energy Information System™, and Aptech Inc.'s EMS-2000, much like Honeywell's 5000 Building System™, is designed as a communication link between the utility and the energy user. The utility could use the interface for customer service and relations, load research, engineering studies for voltage and current analysis, on-line load monitoring, energy efficiency, troubleshooting, and remote reading.

Comverge Technologies, a global subsidiary created by Data Systems and Software Inc. (NASDAQ/NMM:DSSI) also provides

end-to-end, two-way real-time communication solutions for energy related data, automated meter reading, power theft protection, power outage detection, environmental monitoring, and distributed generation monitoring. Frank Magnotti, president of the U.S. Division of Comverge Technologies explains that his company would certainly take the risk of installing the costly new technology, at no risk or expense to the company, in return for a percentage of energy savings, and value added services.

He gives as an example a company that has five or more plants spread throughout New Jersey. Comverge's technology is unique in that it has the metering capability to gather data from every one of the company's plants, to arrange a "package deal" for the aggregation of energy needs, and therefore bargain for a better price for the energy use of the company as a whole. Comverge is planning to broaden its markets beyond utility companies to include energy service providers, cooperatives, aggregates, municipals, and telecommunication network service providers. A pilot program was signed on February 17, 1998, when Volunteer Electric Cooperative and the Tennessee Valley Authority announced a contract awarded to Comverge Technologies to conduct a pilot offering meter reading, real-time pricing and other value-added services to Volunteer Electric's customers. Volunteer Electric Cooperative serves 87,000 customers in 17 counties in Tennessee.

The Power Marketing Association reported on March 11, 1998 that a new service on-line [Youtilities.com](http://www.youtilities.com) ([www.youtilities.com](http://www.youtilities.com)) will make money selling energy usage profiles of its corporate customers to utilities. The utilities can use the information to offer business customers a package of energy and services custom-fit to save them money. The heart of the on-line system will be special "smart meters" installed in large customer facilities, at the on-line service's own expense.

Rick Nelson, Integrated Energy Management vice president at CNG Energy Services Corp., an unregulated services arm of Consolidated Natural Gas Co., explains it this way, "It brings the suppliers and the customers together through an independent medium, which is critical. [Consumers would] trust that more than information provided by any supplier... And they definitely could reduce the cost of getting customers. Other energy companies are putting 300 [salespeople] on the street to do that, and we don't want to. And they could let us offer specific services to fit to each customer." And so the progressive utility can deal with the potential of stranded assets.

If we take the example of the deregulation of the cable and telephone industries, prices changes as a result of deregulation are not likely to be dramatic. In addition, White House economists are actually predicting that the average American homeowner will see a \$70 to \$100 increase in energy bills over the next 15 years if the nation implements the global warming agreement it signed in Kyoto, Japan. One can extrapolate these amounts to large industrial and commercial users. The country's energy policy will be redirected to shift away from burning coal and oil to cleaner burning fuels.

Yet deregulation has spurred on the development of metering technologies that will monitor and make energy use and procurement more cost-efficient, at a cost to the utilities power generation plants. That the utilities will survive as a transmission and distribution vehicle is a certainty given that at the moment they are the only conduits of energy to the consumer. You do not have to buy your power from them, but you still have to use their wires and their pipes, their meters and their billing systems, whether you are a power producer or a power user.

**The virtual utility will become a reality in the next century where telecommunication systems will be sophisticated enough to work with the new real-time metering technology to make it possible for the consumer to have real freedom of choice.**

## References

- 1 Dan Weissman, "PSEILG Lobbying for Controls on Midwest Power Producers," *The Sunday Star Ledger*, March 8, 1998.
- 2 For in-depth detail on RTP, please refer to Larry R. Rowland, "Real Time Pricing and Its Impact on the End User," *Energy User News*, March 1998, page 32.
- 3 Bethany McLean, "Need Electricity? Call Your Broker," *Fortune*, September 29, 1997, page 153.

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**Ed Falkowitz** is a financial executive with 30 years' experience. He holds an undergraduate degree from California State University, a

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