TRACKING THE TRANSFORMATION: THE NEW CROP OF INDUSTRIAL-SECTOR DEMAND-SIDE PROGRAMS AND SERVICES

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The electric utility industry has always faced a rocky path in the application of demand-side management (DSM) in the industrial sector. The diversity and complexity of industrial processes, for example, have long hampered the design and implementation of DSM programs targeted toward process loads. The path toward industrial-sector DSM, however, is now filling up with even more obstacles. Competition, in its various forms, will likely intensify to the point where electric utilities will need to make sweeping changes in order to survive. In anticipation of this, radical changes are already being seen in the direction of DSM.

Under a more competitive scenario, a utility will need to develop an in-depth understanding of its customers – their needs, attitudes, behavior, etc. – and then develop an array of competitively priced products and services to meet their needs. Accordingly, we can anticipate that the future array of industrial-sector demand-side programs and services offered by utilities will be more customer oriented and will largely avoid the adverse rate impacts of many traditional DSM approaches.

We are now beginning to catch a glimpse of the diversity of the utility offerings that market-based thinking is starting to produce. This paper explores the nature of the new demand-side offerings being developed by electric utilities for the industrial sector. Based on a survey of North American utilities, and supplemented with additional industry information, it provides an early look at the new crop of programs and services that are now being offered. Included are power quality services, equipment leasing and sales, electrotechnology and environmental consulting, shared-savings programs, telecommunications, etc. While these types of offerings are not now abundant among demand-side efforts, the directions they suggest are likely to characterize the "mainstream" value-added programs and services of the not-too-distant future.

THE COMING COMPETITION

In recent years, competition has grown considerably as an issue on the minds of electric utility executives. In a 1995 survey conducted by the Electric Power Research Institute (EPRI), "competition" was ranked by 47% of the responding executives as the most pressing issue they will face over the next three years Competition was mentioned more often than the next six issues combined. Moreover, "cost reduction" and "deregulation" (issues closely associated with competition) were ranked as the industry's second and third most pressing issues.

This management focus on competition and its ramifications is understandable. Competition at the wholesale level has been growing for many years, and the 1992 Energy Policy Act and recent FERC rulings have broadened the role of wholesale competition. Discussion of competition at the *retail* level has grown as well. Much of this has been sparked by the 1994 proposal of the California Public Utility Commission (CPUC) regarding the phased implementation of retail wheeling. While the CPUC's May 1995 announcements largely portray support for a "POOLCO" option as the most likely near-term direction for industry restructuring in California, the outcome of the retail competition debates in California and across the nation are far from clear at this time. These debates have been taken as a signal throughout the industry that change is on the horizon. Many in the industry now see retail competition and industry restructuring as inevitable and predict dramatic changes in the nature of the regulatory compact. A utility's monopoly status within its franchise area could be replaced with a more-competitive environment in which utilities compete for the customers they have long taken for granted. A variety of players

(ESCOs, power brokers/marketers, IPPs, RETAILCOs, DISCOs, etc.) may provide electricity and related services to retail customers.

Utilities will have to adapt to this emerging environment in order to survive. In most cases, they will need to move aggressively on a number of fronts.

UTILITY STRATEGIES IN A MORE-COMPETITIVE ENVIRONMENT

In other industries that have faced deregulation, the deregulation process has taken on a life of its own. As a result, it was difficult to accurately predict the directions those industries would take, and the same will almost certainly be true in the electric power industry. Despite this uncertainty, new strategies will be needed to guide utilities through the transition period.

Based on actions and trends that are already visible in the industry, as well as on the experiences of other industries, the following approaches suggest some of the strategies that will likely improve an electric utility's position in the new environment:

- Understanding the Evolving Marketplace
- Retaining and Expanding Profitable Electricity Sales
- Offering New Value-Added Products and Services (including the use of market-driven DSM as a competitive tool)

This is clearly not meant to be a complete list of strategies. Cost cutting, corporate restructuring, mergers/acquisitions, and a host of other approaches will continue to be key utility strategies as well.

UNDERSTANDING THE EVOLVING MARKETPLACE

Understanding the future marketplace will be a key to survival. Utilities will have to greatly expand their databases and insights about the key market players, including customers, trade allies, and competitors.

Customer Needs and Values

Understanding customer needs and values is an important step toward becoming more customer focused and developing successful competitive strategies. A broader set of customer needs will have to be considered in a more-competitive environment. Utilities' market research efforts will not only have to span the range of energy-related issues, but also go beyond energy issues into other areas. In the industrial sector, for example, a customer's energy-related needs may include end-use energy usage, process characteristics, service reliability, power quality, facility management, and environmental issues. In order to really understand the customer's business, however, market researchers may also need to become informed about their customers' needs related to markets, productivity, costs, product quality, new technologies, data communications, process controls, security, automation, and other issues of importance to the customer.

Table 1 presents a list of questions about customer values and the broader market environment that will become more important in the competitive future. Understanding the full range of customer needs and values will improve the ability of a utility to build customer loyalty and improve the retention of traditional sales. It will also help utilities develop and market non-traditional products and services that may prove profitable over the longer term.

Customer Satisfaction and Loyalty. A substantial amount of electric utility effort has recently gone into the assessment of customer satisfaction. All too often, the focus of such studies has been on obtaining a gross measure of satisfaction. Unfortunately, such measures may not be very useful indicators of success in a more competitive marketplace. A significant fraction of customers that currently express satisfaction with a utility may not show much loyalty and may opt for a lower-cost electricity supplier once the opportunity presents itself. The crucial information for a market researcher to uncover in a competitive environment will have less to do with a customer's view about the utility as an institution and more to do with how a customer values specific attributes of the utility's products and services.[2] Understanding the *underpinnings* of satisfaction and customer value can help utilities understand more about their customers and can be used by utilities to target actions that increase their customer focus.

Table 1
Issues Related to Customer Values and the Market Environment

Customer Values:

- *What are the principal buying determinants of our current and potential customers?* What product features are considered when a purchase decision is made? How important are these features relative to one another?

- *How price sensitive are our customers?* How elastic is demand? What product features constitute a source of value that may offset price considerations?

- *Is there an existing or potential basis for establishing brand loyalty for our product?* What product characteristics do our customers associate with quality? How can those characteristics be associated with our product?

- *How do buyer values differ among identifiable customer groups?* Do buyer values cluster in distinctive ways? Can those clusters be identified with easily identified markets, so that customers can be categorized into market segments?

- *How do these various buyer values differ from product to product?* Can competitive advantage be established in different ways for different products in our product line? Are there opportunities for enhancing perceived value by unbundling existing products or by rebundling products in new configurations?

Market Environment:

- *What are the demographic trends in our existing and potential service areas?* What significant changes are occurring in age profile, income levels, family size?

- *What are the major economic forces shaping the service area?* Which industries are growing, which are shrinking? What are the employment trends? What are the principal drivers of economic growth, and how are they changing?

- *What changes in consumer preferences are likely?* What changes in lifestyle trends, fashion, consumer consciousness, and environmental awareness are occurring that may affect electric consumption?

- *What regulatory changes are likely?* How will the scope of competition change? What restrictions will remain?

- *How will technological developments affect demand?* Are any changes in processes or products on the horizon that may affect overall electricity demand or that may create new markets or new market preferences?

This table has been adapted from Reference 1.

Market Segmentation. As competition emerges, utility analysts will have to modify the traditional segmentation approaches that served them well in a more-regulated environment. Analysts will probably have to employ a larger number of segments in order to bring important market niches into better focus.

Needs-based segmentation, which has become more popular in recent years, will become an even more important approach for customer-focused utilities. The family of CLASSIFY tools, for example, provides a useful framework for assisting in developing and marketing utility products and services. CLASSIFY's commercial/industrial segmentation scheme employs nine segments that organize customers based on their needs and attitudes regarding business strategy, business operations, and energy operations.[3]

Additional segmentation approaches may also be useful. For example, it may become increasingly important to segment by the vulnerability, profitability, or location of a customer. Another important segment may become customers that have been lost to the competition. As anyone who has changed providers of long-distance phone service has found out, this is an important market segment in the telecommunications industry.

For a limited number of key industrial customers, the "segment of one" will continue to be the appropriate level of detail for utility marketers and analysts. Providing customized products and services to individual industrial customers will likely become the standard for many electricity providers. This will necessitate having an in-depth knowledge of key customers and being able to rapidly disseminate this information to a wide range of personnel in the utility. Accordingly, enhanced information systems may be required to provide customer service representatives with immediate access to in-depth data about specific customers.

Trade Allies' Needs and Motivations

Trade allies have played very important roles in a variety of utility activities. For example, distributors, builders, ESCOs, and others have become important contributors to the conservation-oriented DSM programs utilities have promoted. However, the changing nature of utility services and the evolving roles of market players will require utilities to keep abreast of their trade allies' needs and motivations.[4]

New trade-ally relationships will likely form in a competitive environment. In the airline industry, carriers have tied a variety of trade allies (such as hotels, automobile rental agencies, credit card companies, and long-distance phone service providers) into their frequent-flyer programs. Relationships in the electric power industry may find utilities teaming more with cable companies, local telephone companies, banks, electrotechnology manufacturers, etc. Some existing trade-ally relationships may wither in the new environment. In either case, understanding the motivations of trade allies in these changing relationships will provide considerable insight in how to organize successful product/service distribution channels.

RETAINING AND EXPANDING PROFITABLE ELECTRICITY SALES

The problem of losing large industrial customers is not new to U.S. utilities. Cogeneration, "over-the-fence" power sales, and various special arrangements have led to the loss of customers for many years. With retail wheeling, however, the potential for customer loss will grow dramatically. In the U.K.'s first wave of competition, for example, a substantial fraction of the largest industrial concerns left their traditional suppliers for cheaper sources of power.

The natural response to this concern is to do "whatever it takes" to hold onto existing sales. This often translates into special contracts and substantial price breaks – within the constraints set up by regulatory commissions – for the largest industrial customers. Just the *threat* of retail competition has given large power users substantial clout in their negotiations with utilities.

While rate cuts may be a necessary part of customer retention in the near term, a continued focus on rates over the long term may lead to trouble for many utilities. Competing primarily on the basis of price drives down a utility's margin, and unless there is hope of being the low-cost provider, competition may put a utility out of the electricity supply business. Instead of trying to compete in a commodity market, an alternative for utilities lies in differentiating their products on attributes other than price.

As described by Dr. Martin Blake of Louisville Gas & Electric Company, utilities have traditionally obtained their market power through their monopoly status. In the coming competitive environment, however, this status will be stripped away and utilities will have to find an alternative basis for their market power. While competing largely on price is one alternative, the more profitable route is likely to be product differentiation.[5]

Another caution should be raised about the "doing whatever it takes" approach to retaining sales. Utilities will need to carefully analyze the profitability of sales to various customer segments. For example, fierce competition for industrial customers with high load factors may make it unprofitable for many utilities to hold onto these customers. Certain segments of the residential and commercial sectors may prove to be a future utility's most profitable and loyal customers.

Pricing

As noted earlier, pricing is already a key factor in the retention of large industrial customers. Utilities are using a variety of pricing mechanisms such as long-term supply contracts, economic development rates, interruptible/curtailable rates, real-time pricing, and various sorts of special contracts to hold onto customers. Detroit Edison, for example, has signed long-term, sole-supplier contracts with each of the big three automakers. Such arrangements are becoming especially popular as a mechanism for providing the customer with a stable price for power and the utility with a secure source of future revenue.

With the onset of retail competition, pricing analysis will take on even greater importance in analyzing industrial customers. The prices of electricity suppliers' products and services will be set more by marketplaces than by regulators using rate-of-return regulation in rate cases, and discriminatory pricing will become standard practice for unregulated components of the electric power industry. In addition, the complexity of pricing structures will expand considerably. Consumers may have a variety of potential electricity suppliers and they may be able to shift frequently from one supplier to another. Prices from these suppliers may fluctuate widely as competitors seek to attract customers in niche markets to make purchases during "niche time periods." Prices may vary by geographic location, power quality level, reliability, length of contract period, amount of power purchased, the source of power, end-use, risk of future price increases, and a myriad of other factors.

This jumble of constantly changing prices will produce headaches for utility market analysts. In this new environment, estimating the response of customers to different pricing structures will be very important and very challenging.

Insights into this future challenge may perhaps be obtained from the experience of the airline industry. Before deregulation, prices were set by rules developed by the Civil Aeronautics Board. As deregulation took effect, pricing chaos resulted. (Many might claim that pricing chaos *still* exists in the airline industry.) A host of new pricing structures emerged, rates changed rapidly (with as many as 20,000 to 30,000 changes per day), new competitors entered the market, and established carriers left the market. Pricing analysis became infinitely more complex. Airlines began to use price discrimination analysis, gaming techniques, and other approaches in their search for profits. Data for many of the models were plentiful thanks to the computerized reservation systems that were being more widely used. The data they provided on customer purchasing decisions, along with the wide range of prices and offerings available, provided a rich source of data for pricing analysis.[6]

OFFERING NEW VALUE-ADDED PRODUCTS AND SERVICES

When telecommunications planners in the mid-1960s tried to predict the future of their industry, it was impossible for them to envision the array of products and services that we now take for granted. AT&T's "one-size-fits-all" service of those days has given way to a plethora of customer choices. Now we have options regarding long-distance provider, hardware selection, cellular service, service contracts, call waiting, call forwarding, calling plans, translation services, and more. In addition, huge growth rates are anticipated for the new data and image communications options that will appear in the not-too-distant future.[7]

The difficulties of the telecommunications planners noted above will probably also face electric utility prognosticators. While we can guess at what the future array of products and services will look like, the ingenuity of the marketplace will eventually determine the choices that consumers will have. Nonetheless, it is useful to consider some of the possible implications of unbundling (and rebundling) and non-traditional product development on the electric power industry.

Rebundled Products and Services

Current electric service offers somewhat more diversity than the AT&T service of old. In the industrial sector, for example, customers are often able to select from among interruptible/curtailable rates, time-of-use rates, real-time pricing, and various other options. However, future offerings will likely represent a much broader set of features. Many of these features will be unbundled from the current offerings and sometimes rebundled into the new offerings. Features may include different levels of service and/or different prices for services such as transmission, distribution, backup power, power quality, reactive power, technology consulting, and energy-efficiency financing.

Using Market-Driven DSM as a Competitive Tool

DSM will be among the services offered by many utilities in the competitive future. Defined as utility encouragement for customers to change the level or timing of their electricity usage, DSM has changed radically over the years. Throughout 1950s and 1960s, load growth was the preferred DSM strategy of utilities. From the mid 1970s to the mid 1980s, load management and electricity conservation became more prominent. However, during the late 1980s and early 1990s, conservation programs came to the forefront and utilities substantially increased the role of these programs as components of their resource plans.

In recent years, the specter of retail competition has been largely responsible for initiating another stage in the evolution of the multi-billion-dollar DSM industry. Many utility managers are curtailing their conservation-oriented

DSM efforts. Foremost on their minds are pressures to keep rates as low as possible and the understanding that most conservation-oriented programs have adverse impacts on near-term rates. While many of the currently popular forms of conservation programs (such as rebate programs) will become less popular in a competitive environment, alternative forms of DSM are likely to remain and perhaps grow. This new set of DSM services will include load management and load building, which generally serve to decrease rates. In addition, some conservation-oriented DSM efforts will be reconfigured to avoid the cross-subsidies that have increased rates in the past. For example, these programs will likely shift from reliance on utility rebates toward incentives based on low-interest loans and shared savings.

Competition will have another impact on DSM. Its advantages as a resource option will become less important and its advantages as a customer service option will become more important. As customers gain the ability to select alternative electricity suppliers, customer-focused utilities will likely have various types of "new DSM" programs on the menu of services they offer. Some utility planners have suggested that if *they* don't make DSM programs available to their customers, some *other* organization will. Then, once retail wheeling becomes a reality, that other organization may have a competitive advantage in offering electricity to some customers. Karl Rabago, while a Commissioner with the Public Utility Commission of Texas, suggested that DSM can be used by utilities as a competitive tool. For example, "utilities must increasingly look to load management activities for their ability to improve system efficiency, lower costs, and increase contact and ties with customers."[8]

Less-Traditional Products and Services

In addition to new offerings based on rebundled features, electric utilities will also expand into a variety of less-traditional products and services. Most of these offerings will probably not stray too far from the familiar territory of generation, transmission, distribution, and energy services. (Many utilities still remember difficulties with earlier diversification ventures that involved areas too far afield from traditional utility activities.)

Equipment leasing/maintenance, risk management/price hedging options, real-time load data, building commissioning, and environmental control services are among the offerings being provided or considered by utilities. Telecommunications-related services are also among the options being pursued/considered by many utilities as likely candidates. In most cases, however, such activities are likely to be very difficult for utilities to undertake on their own. In light of this, a variety of joint ventures have been formed as utilities partner with telephone companies, cable companies, software developers, and others.

Example Value-Added Products and Services

Table 2 lists of some of the value-added products and services that might be appropriate for industrial customers. Utilities are already experimenting with some of these new offerings, often through unregulated subsidiaries.[9]

During 1994, an EPRI-sponsored survey collected data about the new generation of products and services that are starting to be offered by utilities around the nation.[10, 11] This effort builds on the prior series of surveys that have collected data about more-traditional DSM efforts for over 17 years.

The following capsules outline some of the more interesting industrial-sector demand-side programs and services obtained from the 1994 survey and other industry sources.

Financial Services

- Low-interest loans for power conditioning equipment for commercial and industrial customers. (Idaho Power Company)

- Leasing of utility-owned, standby generation equipment to customers. Customers benefit from interruptible rates. (Midwest Power)

- Third-party financing and shared savings for efficient electrotechnologies at commercial and industrial customers' sites. Customers pay no up-front capital. ESCO under contract to deliver services. (Northern California Power Agency)

Table 2
Potential Value-Added Products and Services for Industrial-Sector Customers

Financial Services

- Leasing
- Ownership/investment
- Rebates
- Shared savings
- Risk management/hedging

Information/Expertise

- Design help
- Equipment information
- Usage and power quality info/advice
- Environmental/energy audits
- Environmental abatement assistance
- Power brokering

Communications/Intelligence

- Energy management services
- Time-dependent info/tariffs
- Load research info/svcs.
- Telecommunications
- Security services/monitoring

O&M/Sales

- Backup generation O&M/sales
- Building commissioning
- HVAC & water heat O&M/sales
- End-use product O&M/sales
- Power quality equipment
- Off-grid power
- Energy management/monitoring

Information/Expertise

- Promotion of various medical waste treatment and water treatment equipment (ozonation, microwave/UV sterilization, bio-oxidizing, etc.) to health care customers via information and custom incentives. Promotion of various industrial electrotechnologies, including infrared, UV, radiofrequency, microwave, and induction drying, curing, and heating. (New England Electric System)

- Technical seminars, technical assistance, problem monitoring, and equipment leasing in support of commercial, industrial, and agricultural customer power quality issues. Targeting customers with sensitive electronic equipment. Some equipment is made available on very short-term leases permitting customers to try out potential solution before purchasing equipment. (Salt River Project)

- Promotion of environmental solutions and enhanced product quality through efficient electrotechnologies for industrial customers. Includes electric drying and curing process equipment, electric vehicles, industrial heat pumps, etc. (Pennsylvania Power & Light Company)

- Training and support to help make energy efficiency a part of large customers' standard business practices. As part of the Energy Managers Training Program, customers appoint an energy manager and develop an energy management plan for their facilities. (British Columbia Hydro)[12]

Communications/Intelligence

- Leasing of fiber optic systems to industrial and commercial customers. Leased lines allow customers direct access to interexchange carriers. (Baltimore Gas & Electric Company)

- Real-time energy-use information provided to large commercial and industrial customers through EnerLink Information Service. Southern Company has announced an arrangement with AT&T to incorporate EnerLink customers into AT&T's EasyLink services which provides high-speed data transmission. (Southern Company)[13]

- Real-time pricing for commercial and industrial customers. Each day, customers receive hourly prices that are effective the following day. Dedicated phone lines are used to transmit the price data. (Pacific Gas & Electric Company)

O&M/Sales

- Maintenance and remote dispatch of customer-owned emergency backup generators at commercial and industrial sites. Customer benefits from continual monitoring and increased reliability of generators. (Southern Company)

- Sale of power quality equipment to commercial, industrial, and agricultural customers as part of a program that offers power quality consultation. (Northern Indiana Public Service Company)

- Leasing and maintenance of outdoor security lighting. (Iowa-Illinois Gas & Electric)

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