Flying blind? Consider revenue management

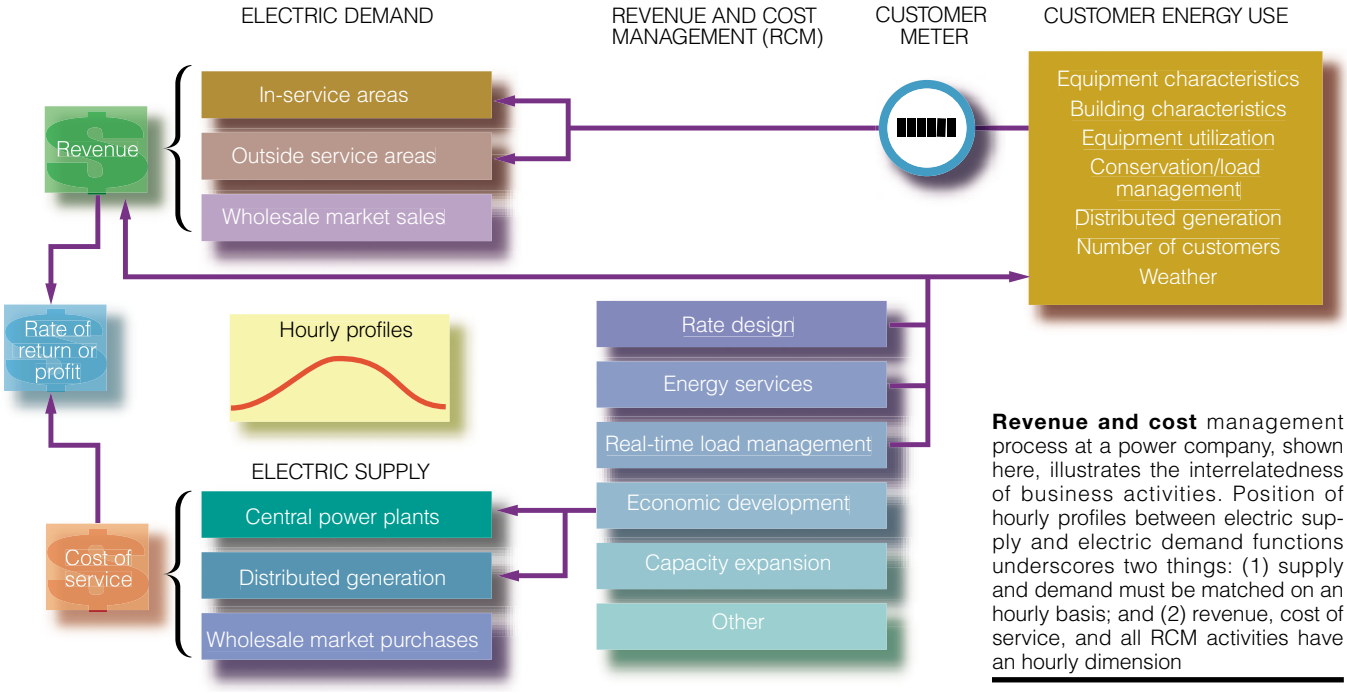
A strategy pioneered in the airline industry two decades ago could serve as a blueprint for competitive power companies seeking profits

By Dr. Jerry Jackson

The lingering recession, disappointing returns in early competitive markets, and fallout from the Enron debacle are putting pressure on electricity providers in both regulated and deregulated markets. In response, the companies struggling most are stepping up their traditional cost-cutting activities—shedding marginal staff, postponing capacity expansions, and selling under-performing subsidiaries.

Nonetheless, "business as usual" seems to be the preferred strategy for most companies. For an industry that continues to look to telecom deregulation and the relatively smooth transitions of the Baby Bells as models for its future, the general lack of management urgency is understandable. However, utility executives are looking at the wrong industry model.

Today's U.S. electricity industry is at the same stage of the deregulation process as the U.S. airline industry was in the 1980s. Accordingly, power companies must develop the same capabilities that passenger carriers did two decades ago. Among them are ways to reduce the effects of pricing



Revenue and cost management process at a power company, shown here, illustrates the interrelatedness of business activities. Position of hourly profiles between electric supply and electric demand functions underscores two things: (1) supply and demand must be matched on an hourly basis; and (2) revenue, cost of service, and all RCM activities have an hourly dimension

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and cost of service distortions, and the flexibility to do time-variable pricing. Without a new and effective overall management strategy to guide them, power companies may not enjoy a future as bright as the one bequeathed to the Baby Bells. Rather, they could find themselves standing on the same precipice that eventually swallowed up Eastern Airlines, Pan Am, and Peoples Express.

One airline industry management strategy that seems eminently adaptable by power companies is based on the application of a business process called yield or revenue management (RM). Understanding how RM works can shed light not only on the reason why American Airlines and United Airlines survived and thrived, while the low-cost supplier—Peoples Express—went out of business. An understanding of RM could also be the foundation of an electricity provider's competitive strategy.

RM for airlines

Revenue management is a quantitative, revenue-maximizing, cost-minimizing strategic process. As mentioned, it came of age in the early 1980s as companies in the newly deregulated airline industry struggled for survival. The revenue management process recognizes the fact that when two groups of customers behave in dissimilar ways to price or service offerings, revenue can be increased if suppliers offer their products and services to the two groups at different prices.

Here's an example. Since an airplane takes off at a prescheduled time, every seat that is not filled represents lost revenue. If, however, airline seats are sold at a low enough price, all of the seats on a flight will be filled. However, this shuts out last-minute business travelers who are willing to pay much more to get somewhere. So offering low airfares is a strategy that does not maximize revenues. A better strategy is to offer tickets whose price structure takes advantage, to the extent possible, of differences in demand by different market segments.

In general terms, RM is a process that uses quantitative analysis to optimize product pricing, product offerings, supply development, distribution, and other customer-oriented business functions—all with the goal of maximizing profits.

RM is credited with a major role in determining the survivors of the airline wars of the 1980s and 1990s. Ironically, Peoples Express, the British company whose Air Train provided a hugely popular first example of deregulation's benefits, blamed its failure on the revenue management strategies adopted by its U.S. competitors.

The technical application of RM has changed dramatically since the early 1980s, when hand-charted yield curves were used to determine pricing structures in individual markets. Today, RM systems use real-time customer demand models and computerized mathematical optimization processes to electronically publish "available fares" as the inventory changes over time.

The reason that RM was so critical in determining competitive success in turbulent airline markets is that its framework forced companies to:

- Quantify price relationships (travel demand functions) for individual market segments, permitting airlines to forecast revenue and load impacts of alternative pricing strategies.
- Quantify equipment supply characteristics and costs.
- Solve demand and supply relationships simultaneously, providing a strategy that optimizes revenues and costs across the entire system.
- Respond immediately to changing market conditions, in some cases with real-time speed.

RCM for power companies

Companies in other industries have used RM primarily for pricing and product development. However, the basic RM model is particularly suitable for use by electricity providers because they can change the cost of serving individual customers. This option is not available in any substantive way to firms in other industries. Each airline customer costs about the same to serve because each one occupies one seat. The electricity industry's version of applied RM is often referred to as RCM (revenue and cost management); the "C" emphasizes the control that electricity providers have over their cost of serving individuals.

How much control do power providers have over their service costs? The cost of meeting each customer's power needs is determined by the mix of resources needed to meet that customer's demand at a specific time. The cost of generating power when overall demand is highest can easily be five times greater than the cost of generating power when demand is lowest. What this means in practice is that the cost of providing elec-

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tricity service to two customers with identical annual consumption can vary by as much as 50% because of the differences in their hourly usage patterns. Unlike airlines, power providers can take steps to modify the cost of serving an individual customer. They include altering the customer's hourly electricity consumption patterns through the use of load management technologies, and "buying back" some of the most expensive power from customers via demand response programs.

At an operational level, the RCM process is used to determine products and product prices, electric rate structures, demand response programs, distributed generation investments, wholesale electric purchases and sales, and all other important activities that determine electric revenue and costs. But at most power companies, each of these activities is nearly always conducted in isolation, or in static situations where dynamic feedback cannot be used to fine-tune the activity.

Worse, most of the activities that the RM process determines are conducted only at aggregate levels, resulting in a less effective and more expensive strategy. For instance, air conditioner load management programs typically offer a single incentive ($/ton/yr) to all customers for installing air conditioner cycling controls. The same level of demand saving could be achieved at a lower cost by instituting a demand response program through which customers can respond to price signals by opting for different cycling periods at different prices.

Clearly, the RCM process is more complicated for power companies than RM is for airlines. Power providers have more ways to affect their customers' behavior, their supply options are more flexible, they can use their customers' diversity to segment their market, and—most important—they have some control over the cost of serving individual customers.

Before attempting to put RCM into practice, a power company must realize that any of the above options it chooses to exercise will affect several of its business processes and revenue streams (figure). For example, changing its electric rates will change its revenues from electricity provision. However, that rate change will also be reflected in customers' overall power consumption, their choice of fuel (a space heater vs. gas heat) and their motivation to conserve energy. For this reason, any RCM activity usually changes the economic evaluation of all other RCM activities. Without a quantitative characterization of these impacts, an electricity provider cannot be certain whether a rate reduction—or, for that matter, a rate hike—will increase or reduce profits.

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Because it provides those quantitative measures, RCM could do for power companies what RM did for the survivors of airline deregulation. Applied similarly, electricity RCM can quantify demand relationships (permitting power providers to forecast the revenue and load impacts of alternative pricing strategies), customer cost of service relationships, and electricity supply characteristics (including distributed generation by end users). What's more, RCM can also solve demand and supply equations simultaneously, providing a strategy that optimizes revenue and cost across the entire system and a capability to react immediately to changing market conditions.

Right place, right time

Is the U.S. power industry ready for RCM? Timing often determines whether an idea is good or bad. The current state of deregulation nationwide has created a business environment that appears conducive to the embrace of RCM. Following are five characteristics of that environment that create a need for a new management strategy as innovative as RM/RCM:

The prevailing management philosophy at most power companies—even those in competitive states—still reflects a lack of urgency bred by decades of regulation. Electricity providers that continue to operate at the glacial pace tolerated by regulators will represent easy prey for the proactive policies provided by RCM strategies.

Huge discrepancies exist between electricity prices and the cost of providing service to individual customers in new competitive markets. That's because the transition from regulated to competitive markets almost always, at least informally, keeps regulated utilities' customer-class rate structures in place.

Power providers enjoy substantial time-variable pricing flexibility with respect to high-cost daily and seasonal peak periods. Companies whose tactical responses to demand fluctuations include real-time pricing and capacity buy-backs can lower their cost of service considerably—and predictably, via RCM.

The Internet, new metering technologies, and other technological advances are shortening the time available to respond to competitors' initiatives. RCM could be a key element of any energy company's drive to make itself faster on its feet.

As in the deregulated airline industry, the cost of entering today's electricity industries is relatively low. This encourages the entry of new competitors, some of whom may find RCM gives them the edge they need. ■

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