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 5555 North Grand Boulevard
 Oklahoma City, OK 73112-5507

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June 2010

Rate Design – What the Board Needs to Know, Part III

This series is a reprint of an article first published in the Spring 2005 Management Quarterly. Part I was printed in the September 2009 issue of the Energy FOCUS and Part II in January 2010. As cooperatives face the increasingly challenging task of maintaining a meaningful rate policy, we thought it would be appropriate to revisit the basic knowledge required by boards to make good decisions.

Customer Revenue Requirement

The next step in the rate process is determining the individual customer's revenue requirement. This is accomplished through the actual design of the per unit charges in the rates. Often, the board is particularly interested in this aspect of the rate process for it is at this point the true impact on individual members becomes most apparent. Comparisons between existing and proposed rate designs should be provided to guide the board in choosing the best alternative. Additionally, it is helpful for the board to have an understanding of the "functionalized" costs which support the rate design.

The cost of service study should identify not only the dollar amount of the costs incurred to provide service to a specific class of customers, but also the type of costs – known as functionalized costs. Functionalized costs include demand-related costs, energy-related costs and customer-related costs.

Demand-related costs are associated with a member's capacity or size requirement. They reflect the demand that the member's load places upon the cooperative's system and the costs of investment

in the plant and facilities to serve that demand. Costs associated with transmission facilities, distribution substation and distribution backbone facilities are examples of demand-related costs, along with any demand charges levied by the cooperative's wholesale power supplier. Energy-related costs are those costs that vary based on the quantity of kWh sold. For a distribution cooperative, the only true energy-related costs are those associated with the fuel and energy component of the wholesale power bill. All other delivery costs are either demand-related or customer-related. Customer-related costs are those costs that are required simply to have the member's service in place, regardless of the size of the load or the amount of energy required. Because cooperatives typically have low consumer density, a certain minimum level of distribution lines and other facilities are necessary to provide service. Other customer-related costs include the cost of the service drop, the meter, a portion of the transformer, meter reading costs, customer service and billing costs.

These so-called "functionalized" costs are used as a tool in establishing the charges that go into the tariff established for each

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No issue facing a cooperative board is more complex and yet more important than its oversight of the development of effective retail rate policies.

What's New With Rates?

Developing new rate structures to address conservation, energy efficiency and the recovery of fixed costs is not a new concept. Cooperatives merely need to look to the PURPA Title 1 Standards and not forget the fundamentals of good rate design in an effort to be new and innovative.

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rate class. It is important for the board to understand their system's customer-related costs of providing service to each customer class, especially residential consumers. The actual "functionalized" customer-related cost of providing service to each rate class is the basis for each class's customer charge. Typical distribution cooperative residential customer-related costs, for example, range between \$20 and \$30 per customer per month. In an effort to more closely match the customer charge in their rates with the customer-related costs identified in their cost of service studies, many cooperatives have begun to increase the customer charge in the residential rate to more closely track the functionalized customer-related cost. This trend is a result of increased competition and the cooperative's desire to minimize subsidies.

Cooperative customer charges have historically been much lower

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rates paid by all members. The more investment costs that are assumed by the cooperative over a period of years, the higher the retail rates will be. Providing service at a reasonable price need not mean unlimited line extension to any location selected by the consumer and subsidized by the other members of the system.

Monitor and Analyze Ongoing Performance

Ongoing oversight is the final step in the rate setting process. It is sometimes overlooked because it does not occur at the same time as the cost of service study or the rate change. It is, however, a critical part of the entire process and should be actively pursued by both the cooperative staff and the board.

Monthly reports should be produced by the cooperative staff to determine how well the financial forecast continues to reflect the cooperative's condition. Are projected sales growth levels being met? Are actual purchased power costs per kWh similar to projections? What about plant additions, interest rates and O&M costs? Are they on target? The forecast should be a living document,

with changes made to meet changing conditions and it should be reviewed by the board on a routine basis.


Cooperative boards should also continue to examine their often conflicting obligation to balance the cooperative's financial needs against the financial impact on members. Rate philosophy and policies vary with individual cooperatives. Some cooperative boards feel that, instead of changing rates as seldom as possible (resulting in large, infrequent rate increases), they should

adopt more frequent and far smaller changes. Some cooperatives prefer to establish rates that produce TIER or other financial coverage ratios at the lowest possible level while others prefer a reasonable cushion for unforeseen contingencies. Some desire to maximize equity by minimizing borrowing from lenders.

Some cooperatives have adopted adjustment clauses for power cost changes or debt cost changes. Boards should consider the adoption of standards for the percentage of total revenue they believe should be permitted from these types of adjustment clauses before an overall

rate adjustment is necessary. If a large portion of a member's monthly bill comes from one of these clauses, the tariffs no longer reflect the total cost paid by customers, and rates become increasingly less based on actual underlying costs. Cooperative boards and management should establish monthly reporting

mechanisms to track over time the changes in the financial forecast and performance of their rates, including any adjustment factors and

line extension contributions. The process of analyzing a cooperative's revenue needs, cost of service allocations and rate design can be a challenge for a cooperative board of directors. However, when the process is clearly defined in a series of understandable steps and time is devoted to the task, the cooperative board will be better positioned to make informed, balanced and fair decisions, and effectively communicate to members the rationale behind the cooperative's rate policies. 

David Hedrick
 david.hedrick@chguernsey.com

"The forecast should be a living document, with changes made to meet changing conditions..."

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than the actual customer-related costs. This has created an intraclass subsidy; a subsidy between individual customers within the same class. When the customer charge component of the rate is lower than the actual cost to serve, the energy component or kWh charge must increase in order to recover the total cost for the class. Such a rate structure benefits minimum use and low use customers who do not pay the full required cost. Meanwhile the higher use customers who consume more kWh will pay a greater share of the costs. This is of particular concern to boards whose cooperatives have a high number of minimum bill or seasonal accounts. It is also of particular concern to cooperatives facing retail competition who may be charging the very high-usage customers — who are most coveted by the competition — a higher rate to subsidize low-usage customers.

Balance is again the key in determining the appropriate rate design. Although the cost of service analysis may indicate that a certain level of customer charge is justified, the impact on consumers of implementing that customer charge may be too great. Multiple rate changes over several years may be required to accomplish the board's long-term goals with regard to the customer charge.

The discussion of customer-related costs points out the fundamental principle of rate design; the development and implementation of cost-based rates.

Simply stated, the retail rate to the consumer should recover, to the extent possible, the costs of providing service in the manner in which the costs are incurred. This is especially true with regard to recovery of wholesale power costs. A well designed rate reduces the cooperative's risk associated with the wholesale components of costs and accurately reflects recovery of distribution wire costs.

There is no "one-size-fits-all" rate design. There are many different types of rate designs for different purposes. There are seasonal rates to reflect different seasonal power cost differences, declining block or demand rates to reflect the general trend of power cost to decline in volume, time-of-use or interruptible rates to motivate energy efficiency and many other rate structures. The cooperative board and management may want to look at a number of rate alternatives before selecting an option that best meets their individual needs. The benefits and risks of each alternative should be discussed. In reviewing various rate alternatives, the board should be sure that their rate choice recovers all of the costs to provide service and minimizes risk.

Coordinate Line Extension Policy With Rate Design

A key area often neglected in the rate process is the cooperative's line extension policy. Typically, a line extension policy covers how line is extended to provide service to new members and who pays for it. Most cooperatives have some cost sharing built into their policy between the

cooperative and the member. Any line extension cost paid by the individual member reduces the cooperative's investment. Any remaining amount is paid, not by the individual member requesting it, but by all members, ultimately through their rates.

Any time changes are made to rates, the board should also review the impact on the line extension policy. Inherent in the development of rates is recovery of the investment costs to provide service to the various customer classes. The revenue received from a new load must be sufficient to cover the cost of the additional investment required to serve that new load.

The cost of service study can help the board with this analysis. The results of the study identify the total dollar amount of line extension investment supported by each rate class at different average usage levels. Cooperative boards can incorporate this information into their line extension policies. Based on the cost of service results for example, the cooperative may agree to pay for the first \$1,500 of new line extension to the residential class. Any amount in excess of \$1,500 is paid by the prospective member.

The key point for directors to consider with regard to the line extension policy is to not lose sight of the link between rates charged to consumers and the amount of plant or facilities in which the cooperative can afford to invest. The line extension policy should reflect the relative risk and life expectancy of the new load as well. This may require a significant shift in the cooperative's historic philosophy. Many systems have essentially provided line extensions to most new consumers at little or no cost. While no one would recommend that cooperatives forget their roots and abandon the principle of providing fairly-priced service to consumers in areas where it is more costly to serve, it is important that the board balance the cost of providing a certain level of line extension — at no cost to an individual member — with the impact that policy will have on

See Rate Design on page 4.

What's New With Rates?

Probably the most frequently asked question I get these days is, "What new or different rate design should be adopted in response to the various issues facing cooperatives today?"

Of course, the answer is not the same for every situation. In the pressure to be new or "innovative" we should not forget the importance of rate making fundamentals. While not new, they should be considered in all rate designs.

First and foremost, rates should recover the costs of providing service. This was the first of six standards of rate design included in Title 1 of PURPA in 1978. The importance of this fundamental principle is evident. Rates not based on cost put the cooperative's margins at risk and create subsidies between rate classes and between customers in the same rate class. Competition is often cited as the key reason for straying away from the cost of service concept. Designing a rate structure that is both market-based and competitive is certainly achievable. However, if the rate does not recover the full cost to serve, it will not be sustainable and will lead to losses and subsidies.

Other standards included in the PURPA address time-based rates, seasonal rates, interruptible rates and load management rates. It should be noted that the three stated purposes of the PURPA Title 1 standards applicable to utilities since 1978 are to encourage:

1. the conservation of energy supplied by electric utilities,
2. the optimal efficiency of electric utility facilities and resources, and
3. equitable rates for electric consumers.

It is interesting to note that even way back in the '70s there was recognition of the need

for conservation, efficiency and fairness. For many years, cooperatives across the country have been designing rates based on these fundamentals. It is somewhat disconcerting that rate making concepts set forth back in 1978 and used in the design of rates by cooperatives for years are now being extolled by some as new and innovative concepts.

For example, what has been coined as decoupling — reducing the potential impact of increased or decreased energy sales on margins — is a great idea. For cooperatives, decoupling is more of a cost of service and fairness issue. It is an effective way to reduce the financial impact of energy efficiency, distributed generation programs and even fluctuations in energy consumption caused by the weather. Yet, this is hardly a new concept. Many of our cooperative clients have been methodically increasing their customer charge in order to recover more of the distribution fixed costs for just these reasons.

It is important not to overreact to the potential negative financial impacts of energy efficiency and distributed generation on cost recovery by increasing customer charges too much too quickly. Potential negative impacts resulting from energy efficiency and conservation measures will be


gradual over the next several years. Having a rate strategy that moves the customer charge up over time and provides a reasonable customer impact provides both the stability that the cooperative needs as well as member acceptance.

Likewise, other rate design concepts that are now getting a lot of attention such as time-based rates, inclining block rates, interruptible rates and load management rates

have been implemented, refined and improved by many systems over the past thirty years. Much has been learned about how these rates work, how member-

"Designing a rate structure that is both market-based and competitive is certainly achievable."

consumers accept and respond to such rate designs and the expected impact on consumption and cost. It is vital that the lessons learned be included in the process of developing new rates.

Some of these rate designs may be appropriate at your system. All of them should be considered and studied. However, not all rate designs will be embraced by members. For example, residential members have historically resisted participation in time-based and load management rates. Providing effective member education is as important as the rate design itself in achieving price and cost reduction as well as efficiency and conservation goals. Moreover, the desire of public power utilities like cooperatives to always consider member impact over profits is as innovative today as it was 74 years ago. 

David Hedrick
david.hedrick@chguernsey.com

GUERNSEY Seminars

Texas Electric Cooperatives is offering GUERNSEY's cost of service and rate design, financial forecasting and accounting seminars. The seminars are hosted by the statewide association and will be held at various locations throughout the state. Cooperatives from anywhere in the U.S. are invited to register. For dates and locations, contact Esther Dominguez at Texas Electric Cooperatives at (512) 486-6211 or visit www.chguernsey.com/seminar.

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