

MQ

MANAGEMENT QUARTERLY

Spring 2005, Vol. 46 No. 1

Retail Rate Development: The Role of the Cooperative Board

David Hedrick



National Rural Electric
Cooperative Association
A Touchstone Energy® Cooperative

Retail Rate Development: The Role of the Cooperative Board

David Hedrick, Sr. Consultant, C.H. Guernsey and Co.

No issue facing a cooperative board is more complex and yet more important than its oversight of the development of effective retail rate policies. No one likes to raise rates. And no one likes sitting in a dark board room staring at a glowing projection screen full of row after row of numbers.

Cooperative board members are no exception; yet they must gain a basic understanding of how proposed rates are developed. So how does today's cooperative manager determine the appropriate level of involvement by the board which enables effective decision making without an information overload that can lead to loss of understanding or even paralysis in the rate changing process?

Experience suggests the answer varies from system to system. However, given the potential impact on members, development of properly designed rates requires input from all disciplines within the cooperative, including: accounting, customer service, human resources, engineering, operations and management. As the policy setting entity and, in some states the rate setting entity, the board is well served to have a solid understanding of the breadth, if not the detailed financial intricacies of the issues. The board also serves as a key communications conduit between the cooperative and the membership.

Every board member at a cooperative implementing a rate increase has no doubt heard questions like these from the members they represent: "Why are you raising my rates?" "Why did you raise my customer charge instead of just the energy charge?" "Why did the rates for residential customers go up 5 percent while rates for irrigation customers went up 7 percent?" Trustees who understand industry trends and have a basic understanding of the rationale behind the rate design and the process of setting rates can more effectively answer these questions.

THE RATE CHANGE PROCESS

The rate change process generally begins as a result of any number of factors. They include:

- a recognized deterioration in the system's financial indicators
- a change in the wholesale cost of power
- response to competitive pressure
- response to a special contract rate request from a member

Whether the cooperative is conducting a complete review of its rates, developing a special contract rate or a proposed rate for a new rate class, the standard process of rate development is essentially the same.

Standing at the beginning of a rate design project and gazing out over the landscape of the information to be reviewed, analyzed and transformed into a meaningful report can be overwhelming. One way for a distribution cooperative board to “wrap its arms around” the process is to break it down into five distinct steps:

- Determine the overall system revenue requirement
- Develop the class revenue requirements (Cost of Service)
- Develop the individual customer revenue requirements (Rate Design)
- Coordinate the line extension policy with base rate design
- Monitor and analyze ongoing performance

The board’s role in the rate analysis process is to balance two sometimes conflicting duties. This is an essential and often challenging role that cooperative directors must assume. The first duty is to meet the cooperative’s financial objectives and maintain satisfactory financial ratios. The second duty is to minimize the impact of costs on members by providing the lowest reasonable rates. If rates are set too low, the cooperative risks not meeting lender mortgage requirements, experiencing decreased cash levels and declining equity levels. If rates are too high, the cooperative risks consumer unrest and uncompetitive rates. The task before the board is to balance these two competing objectives in determining the cooperative’s overall revenue requirement.

DEVELOPMENT OF OVERALL REVENUE REQUIREMENT

The first step in the development of the overall system revenue requirement is determining the appropriate level of margin. The

Table 1: Comparison of Rate Design Options

COMPARISON OF RATE DESIGN OPTIONS		
kWh Usage	Typical Rate Design	Cost Based Rate Design
Customer Charge	8.00	25.00
kWh Charge	0.075000	0.060837
0	8.00	25.00
50	11.75	28.04
100	15.50	31.08
200	23.00	37.17
400	38.00	49.33
600	53.00	61.50
800	68.00	73.67
1,000	83.00	85.84
1,200 Average Usage	98.00	98.00
1,500	120.50	116.26
1,800	143.00	134.51
2,500	195.50	177.09
3,000	233.00	207.51
5,000	383.00	329.19

Directors must be conscious of customer impact when considering rate design alternatives. In this example, both rate designs produce the same total revenue from the Residential rate class. In the Cost Based Rate Design, however, all customer-related costs are included in the Customer Charge instead of being partially recovered through the KWh Charge. Average users are not affected; however, low-use customers experience a noticeable rate increase while high-use customer receive a noticeable rate decrease.

financial criteria required to define the level of margin is based on each individual board's objectives associated with:

- Equity Management Plan
- Capital Credit Refund Policy
- General Funds Level Objective
- Coverage Ratio Required by Lenders

There is a margin requirement associated with each criterion noted above. It is critical for the board to understand the relationship between these objectives when determining the overall revenue requirement. The board cannot focus on a single financial objective; it must consider all objectives and how they interact. For example, when considering the equity level established in the equity management plan, it is imperative that the board be mindful of the effect that equity level has on the overall revenue requirement. As investment in new plant increases, the required margin to maintain a specific equity percentage level also increases. If growth in plant is

The results of a capital planning model or financial forecast enable the board to see the relationship between their financial goals and anticipated system performance as those goals are implemented.

not also accompanied by a sufficient increase in sales it can be a real challenge to maintain the equity objective without an increase in rates. The equity

objective also determines the level of debt to be incurred by the cooperative. This directly impacts the level of debt service payments which in turn affects the system's financial coverage ratios. In addition, the rotation of capital credits affects the level of cash reserves, which also affects equity levels and ultimately the cooperative's overall revenue requirement.

A capital planning model or financial forecast prepared by staff and management are valuable tools in the evaluation of the overall system revenue requirement. The results of these types of analyses enable the board to see the relationship between their financial goals and anticipated system performance as those goals are implemented

during the next three to five years. The board should be presented with a clear view of the big picture with regard to the cooperative's financial objectives, how the system will achieve those objectives and how those objectives impact rates.

While developing, evaluating and monitoring policy is the board's primary responsibility, it is also important that directors have a working knowledge of the rate change process. Developing the system revenue requirement is like taking a typical cooperative income statement and turning it upside down. Once the required level of margin is determined, the revenue requirement calculation proceeds from the bottom of the income statement toward the top. Using a historical twelve-month test year, staff and management identify the known and measurable adjustments to operating expenses, interest expense and non-operating activities. These items are then added to the required margin to determine the overall system revenue requirement.

DETERMINATION OF CLASS REVENUE REQUIREMENT

The second step in the development of rates is the determination of class revenue requirements – determining if each rate class is “pulling its own weight.” This is accomplished through a cost of service study. While the board typically should not be involved in detailed development of the cost of service study, the general process should be discussed and understood.

The purpose of the cost of service study is to determine the level of margin produced by each rate class under existing rate schedules and to calculate the required change in revenue for each rate class based on the proposed overall system revenue requirement. This is accomplished by developing percentage allocations to spread the plant investment required to serve each class, along with associated expenses. For example, consider substation expense. Some distribution cooperatives own substations. Substation plant and related operations and maintenance expense is typically allocated to the rate classes based on their peak capacity requirement because substation facilities are built large enough to meet the sum of the peak loads of all customers. Other costs of service are allocated to

each customer class using a similar approach. Development of the allocations used in the cost of service study requires the involvement of the cooperative's engineering, operations, customer service and management groups.

The board should look for consistency of approach in the development of the cost of service study. Generally accepted methodologies for developing the cost allocations should be used as opposed to development of a cost allocation that uses assumptions and methods intended to achieve a predetermined outcome. If the cooperative's rates are regulated by a state utility commission, the methodology is predetermined. If the cooperative is exempt from

A properly prepared cost of service study provides the information the board needs to determine the appropriate course of action for changes in rates for individual rate classes.

commission regulation, it should use the same basic methodology as if it were regulated. In either case, the cooperative has a result

that is defensible in the event of questions or challenges from members or other power suppliers.

The board of directors should have a realistic assessment of the cost to serve each rate class and that should be presented in a well prepared analysis. A properly prepared cost of service study provides the information the board needs to determine the appropriate course of action for changes in rates for individual rate classes. For example, the study might show that, while the cooperative as a whole requires a 3% rate increase, the residential rate class requires a 5% increase and the large power class requires a reduction to meet the system average rate of return. The board in this example must carefully weigh the disparity between the classes while balancing member and financial impact.

The summary of the cost of service study should clearly show the level of margins earned from each rate class. Some rate classes will provide higher rates of return than the system average while others will yield lower rates of return. Typically for cooperatives, large commercial and industrial classes yield higher rates of return than residential or general service classes. This is not uncommon. It is

Table 2: Cost Allocation Summary

STANDARD ELECTRIC COOPERATIVE, INC.				
Existing Rates				
Test Year Ending December 31, 2003				
Cost Allocation Summary				
Account	Total	Residential	Commercial	Large Power
Rate Base	159,647,771	148,637,422	8,135,177	2,875,173
Operating Revenues	86,375,000	76,341,226	4,612,663	5,421,109
Operating Expenses	82,632,068	73,890,140	3,844,903	4,897,024
Return	3,742,932	2,451,086	767,760	524,084
Rate of Return	2.344%	1.649%	9.438%	18.228%
Relative ROR	1.000	0.703	4.026	7.776
Interest	5,997,067	5,585,119	305,171	106,776
Operating Margins	-2,254,135	-3,134,032	462,588	417,308
Margin as % Revenue	-2.610%	-4.105%	10.029%	7.698%
Operating TIER	0.624	0.439	2.516	4.908
Revenue Deficiencies				
Uniform ROR= 7.114100	7,614,570	8,123,128	-189,016	-319,542
Deficiency % Rev	8.816%	10.641%	-4.098%	-5.894%
Uniform % Mar= 5.703223	7,614,570	7,940,826	-211,585	-114,670
Deficiency % Rev	8.816%	10.402%	-4.587%	-2.115%

The Cost of Service Study often indicates some rate classes subsidize other classes. In this example, the total system requires a \$7.6 million (8.8 percent) rate increase to realize the cooperative's desired ROR. In order for each rate class to produce the same ROR, the residential rate class revenue must increase 11 percent while the commercial and large power rate class should receive a decrease. The Board should focus on the level of margin produced by each rate class and the resulting magnitude of subsidy that exists. The Board's task is to determine the appropriate class revenue requirement and thus the level of inter-class subsidy that will exist in the proposed rate design.

typical for some degree of subsidy to exist among rate classes. This is one of the key issues the board must consider when setting individual class revenue requirements. The board should focus on the level of margin produced by each rate class and the resulting magnitude of subsidy that exists. The board's task is to determine the appropriate class revenue requirement and thus the level of interclass subsidy that will exist in the proposed rate design.

For rate regulated cooperatives, the standard approach used by state utility commissions in the development of the class revenue

Board members should not ignore the concept of risk when determining the individual class revenue requirements as providing service to certain classes of consumers is inherently more risky than others.

requirements is to move the rate of return for each class toward the system average. The goal is to eliminate subsidies by requiring that all classes have the same rate of return. Over time, the class rates of return are equalized. Missing from this approach, however, is recognition of the different levels of risk assumed in serving different classes of consumers. Board members should not ignore the concept of risk when determining the individual class revenue requirements as providing service to certain classes of consumers is inherently more risky than others. For example, certain commercial accounts are far more risky to serve than a residential load. Some cooperatives, for example, serve customers whose operations are dependent on government policy—such as ethanol facilities or coal bed methane facilities that have a limited life. The high levels of plant investment that are often required for such loads, coupled with the high levels of revenue from these commercial consumers, create a higher potential for loss should the consumer substantially reduce consumption or leave the system. As the risk of serving such consumers increases, the board should consider a higher rate of return for this rate class in order to protect other members.

Perhaps the most important single concept for the board to grasp is that any cost of service study should be viewed as a tool for use in determining rate levels for individual classes, not a roadmap to be followed blindly. The board should always consider the impact on

consumers in deciding rate levels. The cost of service analysis will identify existing subsidies between rate classes that should be carefully scrutinized. Often, the justifiable correction of these subsidies is of such magnitude that a one-time rate change would be overly burdensome on the members in the affected rate classes. Board members are rightly sensitive to the possible impact on member's bills and must weigh the results of the cost of service study against the impact on consumers of possible rate changes when determining class revenue requirements.

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 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

Table 3: Allowable Line Extension Investments

CALCULATIONS OF ALLOWABLE LINE EXTENSION INVESTMENT			UNDER PROPOSED RATES FOR RESIDENTIAL RATE CLASS		
Billing Units	Very Low Usage	Low Usage	Class Average Usage	High Usage	Very High Usage
Billing Units					
Allocated Annual kW	3.66	18.29	48.57	54.88	73.18
Annual kWh	1,200	6,000	15,929	18,000	24,000
Total Annual Billing (kWh)	203.43	297.15	491.01	531.45	648.60
Cooperative's Allowable Line Extension Investment					
5 Year Project Life	\$208.73	\$146.78	\$18.65	\$0.00	\$0.00
10 Year Project Life	\$354.21	\$440.18	\$618.02	\$655.11	\$762.58
20 Year Project Life	\$496.61	\$727.37	\$1,204.69	\$1,304.25	\$1,592.69
30 Year Project Life	\$566.69	\$868.69	\$1,493.39	\$1,623.69	\$2,001.19
35 Year Project Life	\$589.89	\$915.47	\$1,588.95	\$1,729.43	\$2,136.41

The cost of service study can identify the dollar level of line extension investment supported by each rate class at different usage levels. In this example, the cooperative can provide the first \$1,588 of new line extension to the average residential customer assuming the service is in place for 35 years.

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

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 than the actual customer-related costs. This has created an intra-class 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

A well designed rate reduces the cooperative's risk associated with the wholesale components of costs and accurately reflects recovery of distribution wires costs.

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 wires 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 desire 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.

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 rates paid by all members.

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 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 is a Senior Consultant with C.G. Guernsey and Company. He has 23 years of experience working with electric cooperatives throughout the nation in the areas of rates, cost of service, financial analysis, line extension policy and management training. He may be reached at david.hedrick@chguernsey.com.