Setting Rates: Best Practices for Electric Cooperatives

PART 1

APRIL 27, 2007

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Introduction to Best Practices in Rate Setting

Overview of Part 1

This special Solutions insert is the first in a series of articles about how electric cooperatives can apply best practices when setting retail rates for their member-consumers. Electric cooperative managers and board members recognize the important role they play in setting rates. After all, the composition and design of electric rates has a direct impact on the cooperative's ability to pay its operating and financing costs. Rate design also demonstrates value to members.

Setting rates includes these tasks: load research and forecasting, revenue requirements estimation and allocation to electric service functions, allocation of those service function revenue requirements to consumer rate classes and rate design for respective classes.

Specific topics that will be addressed in this series, "Setting Rates: Best Practices for Electric Cooperatives," will evolve based on input and feedback.

Part 1 covers these topics:

- Applying best practice concepts to electric rate setting
- Rising revenue requirements and principles for their recovery from member-consumers
- An overview of electric cooperative rate setting and some alternative practices
- Future topics and chapters in this series
- Glossary
- Additional resources

Applying "Best Practice" Concepts to Electric Rate Setting

The term *best practice* is sometimes defined as a state-of-the-art technique for performing a narrowly defined business process. For example, basing electric rates on most likely projections of revenue requirements and the power and energy demands of an electric cooperative's various consumer rate classes is accepted as standard electric utility practice. In this series on rate setting, *best practices* refers to methods for accomplishing the component tasks of making those projections.

Consensus as to which business practices constitute the "best" changes over time. Best practices associated with electric rate setting can be expected to change as metering technologies, energy economics and other factors evolve. In addition, each cooperative's size, consumer needs, competitive situation and other business characteristics will strongly influence how a cooperative selects from among alternative rate-setting best practices.

Increasing costs, particularly power costs, are pressuring electric cooperatives to raise rates. As a result, cooperative boards and their management will be forced to find ways to continuously improve the rate-setting process.

Rising Revenue Requirements and Principles for Recovery

A recent CFC survey indicates that about 51 percent of electric cooperatives expect they will have to raise their residential electric rates by 5 to 20 percent per kilowatt hour (kwh), on average, each of the next five years.

These increases are mostly expected to result from electric cooperative investment in generation and transmission facilities, pollution/environmental equipment, the anticipated volatility in commodity fuel costs, increases in interest rates, increased distribution system expenses and other capital costs. In addition, while their electric rates are rising, customers are also likely to use more electricity.

The Four Principles

It may be necessary for an electric cooperative to raise rates several times and in relatively large increments in order to raise needed revenues. As a result, a cooperative's management and board should review rate-setting processes for consistency using the following four principles:

1. A cooperative's rate structure should be designed to collect adequate revenue from the member-consumers who use the electricity. The costs of providing electric service range from highly variable generating fuel expenses to plant expenses, which vary only over long periods, as well as margins to finance plant additions and replacements.
2. Total cooperative revenues should be sensitive to changes in expense drivers. As consumers of different classes are added or lost, the costs of their power and energy demand and consumer service must be promptly recovered.
3. A cooperative's rate design should be understandable to its members and motivate them to use electricity and resources wisely—which will help reduce current and future costs. For example, line extension policies should reflect new plant costs fairly and demand charges need to discourage costly demand peaks.
4. Electric rates should be revised seasonally, annually or as often as needed in order to clearly communicate the cooperative's changing revenue requirements to the members.

These principles are not new to electric cooperatives, but their simultaneous application may be difficult, demanding careful analysis of technological, economic and member service factors.

An Overview of Rate Setting and Examples of Best Practices

Application of these four principles is usually a sequential process. Following is a summary of typical steps for setting retail electric rates:

1. Load research.
2. Load forecasting.
3. Estimating annual revenue requirements (and some examples of best practice alternatives for each).
4. Allocation of revenue requirements to electric service functions.
5. Allocation of functional revenue requirements to member-consumer classes.
6. Rate design.

LOAD RESEARCH

Load research seeks to classify a cooperative's members according to distinctive energy and power demand patterns. In order to establish seasonal load profiles, these patterns may be as aggregated as annual kwh billing or as discrete as hourly electricity consumption.

Examples of best practices for conducting load research:

- If it is justified by cost-benefit studies, a cooperative can use time-of-use energy consumption or power demand metering.
- It is acceptable to separate member-consumers into distinct classes or rate codes whose intra-class characteristics are reasonably homogenous.
- It is acceptable to employ seasonal demand measurement throughout seasons (or perhaps, monthly) in the absence of time-of-use metering.

LOAD FORECASTING

Load forecasting is done in the following manner: An electric cooperative researches the power and energy demands of selected consumer groups. The utility then projects the usage numbers over time for the period that the subject rates are to be in effect.

Some examples of best practices for load forecasting:

- Conduct load forecasting by using weather normalization, which will factor climate trends in or out of the forecast.
- Use appliance saturation studies to approximate trends of household energy needs if end-use forecasts are employed.
- Use various statistical techniques to indicate ranges of future demand, rather than specific point-demand estimates.

ESTIMATING REVENUE REQUIREMENTS

An electric cooperative's main revenue requirements include costs associated with purchased power, depreciation, interest, operation and maintenance, general and administrative expenses, plus margins for debt service coverage (an equity component). These costs are typically estimated in the following manner. Start with the data for a historical period and then adjust each line item, as necessary, for expected adjustments in the period in which the new rates will be in effect.

Some examples of best practices for estimating revenue requirements:

- Selection of the level of detail for collecting base-year actual revenue requirements data, which may be found at the general ledger account level, in departmental budget line items or in some other form.
- Identification of revenue requirement adjustments to reflect future business conditions, perhaps by cooperative business planning, budgeting, distribution system work

plan development or marketing research or all of the foregoing, or use of a projected test year tied to the cooperative's budget.

- Assessment of the adequacy of estimated revenue requirements on both rate of return and cash bases.

ALLOCATION OF REVENUE REQUIREMENTS TO ELECTRIC SERVICE FUNCTIONS

Figuring and allocating revenue requirements for the different areas of an electric cooperative's service functions can be broad and simple or extremely detailed. It might be as simple as dividing revenue requirements among energy delivery, power delivery and administration. Or it could be much more detailed to the level of generation, fuel, transmission, distribution, metering, billing, tax collection and other unbundled activities.

Here are two examples of best practices for allocation of revenue requirements.

- When selecting the appropriate level of detail for revenue requirements for unbundled services, the cooperative's rate regulator (if applicable) must be considered. Another consideration is the amount of data that management will need when it decides whether to outsource business functions.
- Individual revenue requirement line items can be classified in three different ways: (1) directly assigned (e.g., allocation of metering contractor costs directly to the metering function), or (2) varying with assigned costs (e.g., general and administrative expenses allocated to functions in proportion to directly assigned operation and maintenance payroll expenses), or (3) allocated on other bases such as net plant investment for respective functions.

ALLOCATION TO CONSUMER RATE CLASSES

Electric cooperative members in different rate classes cause the cooperative to incur costs in different patterns. For example, it probably takes more staff time to meter and bill large industrial consumers than it does for typical residential members. On the other hand, residential members usually cause the cooperative to bear higher energy costs on peak load days than those industrial consumers who switch to self-generation at such times.

Following are four examples of best practices that can be used when allocating functionalized revenue requirements to consumer rate classes.

- Implement periodic consumption metering reviews, which might range from monthly to hourly.
- Decide on the mix of coincident and non-coincident peak demand contributions used for allocations to respective consumer classes.
- Decide on the frequency of rate changes, from seasonally to monthly to daily.
- Select the degree of cross-subsidization among consumer rate classes, if any, based on competing energy costs of those classes.

RATE DESIGN

Rates charged to each type of electric cooperative rate class should be designed to collect their allocated portion of revenue requirements. Factors influencing rate design include:

- Availability of power demand (as opposed to energy consumption) metering data.
- So-called lifeline or other low-income rate policies.
- The cooperative's energy conservation goals.
- Regulator tariff requirements.
- The price elasticity of demand of respective consumer rate classes.

Following are three examples of best practices to employ in rate design.

- Consider the extent to which customer- and demand-related fixed costs of the cooperative are rolled into energy charges to members. Review block rate designs, for example.
- Be precise in the separation of cooperative variable-and fixed-revenue requirements when developing large industrial and commercial interruptible rates.
- Allocate wholesale power cost components among rate classes based upon their respective causal responsibilities.

It is the responsibility of the electric cooperative's management, staff and board to make a series of judgments about the alternative techniques for estimating the cooperative's aggregate revenue requirements and allocating those requirements to functions and member rate classes.

Forthcoming Topics in this Series

At present, the following topics are planned as part of this series:

- The evolution of electric cooperative rate-setting practices, including the impacts of key federal legislation.
- Load research and alternatives to reliably estimate which consumers are causing which cooperative costs over time.
- Forecasting future energy and power load.
- Estimating cooperative revenue requirements, beginning with test-year data and adjusting it for predictable changes in cost of service.
- Cost-of-service study techniques for allocating revenue requirements to electric service functions and then to consumer rate classes.
- Design of rates and fees to recover electric cooperative costs and meet other goals.
- Formulary rate structures and their benefits for facilitating timely tariff adjustments.
- Distributed generation rate considerations.
- Theoretical and technological aspects of demand response pricing.
- Performance-based rates, as typically implemented by for-profit electric utilities.

Glossary

Block Rates – A rate structure in which the charge per kwh changes with the level of monthly consumption, e.g., $0.04/kwh for the first 100 kwh, $0.09/kwh for the next 500 kwh and $0.06/kwh for all consumption above 600 kwh in the subject month.

Electric Service Functions – Various productive activities required to create and deliver electricity as well as operate an electric cooperative, e.g., power generation and transmission, electric distribution, metering and billing.

Interruptible Rates – Electric service rates, usually to large industrial and commercial members owning standby generation that the cooperative can curtail or cease by agreement.

Lifeline Rates – Low rates charged for some minimum monthly kwh consumption by a specified rate class (perhaps identified low-income consumers or all residential consumers).

Revenue Requirements – Aggregate costs of service to be recovered each year from consumers (including power costs, depreciation, interest, operation and maintenance and other expenses) plus capital costs (margins for debt service coverage, in the case of cooperative) reduced by non-operating revenues.

Seasonal Rates – Rates that vary according to the season of consumption; for many cooperatives, summer rates tend to be higher because of the higher demand and related power costs.

Tariff – A document, approved by the cooperative's board and/or regulatory agency, listing the terms and conditions, including a schedule of prices, under which electric service will be provided.

Time-of-Use Rates – Electricity prices that vary according to the hour of their consumption and, therefore, can reflect the cooperative's costs of purchased power.

Unbundling – Disaggregating electric utility service into basic components (e.g. distribution, billing, etc.) and offering those components for sale separately, each with its own rate.

Additional Resources

Faruqui, Ahmad & Earle, Robert (February 2006). *Lessons for a New Generation: Revisiting the Principles of Electric Ratemaking and Rate Design*. Public Utilities Fortnightly.

Gordan, Kenneth & Olson, Wayne P. (December 2004). *Retail Cost Recovery and Rate Design in a Restructured Environment*. Edison Electric Institute.

Morrison, Jay (Fall 2006). *Retail Rates, Distributed Generation, and the Energy Policy Act of 2005: Did You Meet Your First Deadline?* NRECA Management Quarterly.

NARUC Staff Subcommittee on Accounting and Finance (Summer 2003). *Rate Case and Audit Manual*. National Association of Regulatory Utility Commissioners.

O'Dell, Carla & C. Jackson Grayson, Jr. (1998). *If Only We Knew What We Know: The Transfer of Internal Knowledge and Best Practice*. Simon & Schuster, Inc.

Review Panel

The following electric cooperative staff serve as the review panel for the series, "Setting Rates: Best Practices for Electric Cooperatives."

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