THE BENEFITS OF COST OF SERVICE STUDIES

By John Wolfram

Utilities often perform cost of service studies in a crisis – when margins are tight or when an immediate rate change is needed. However, cost of service studies provide useful information to a utility not only in a crisis but also as part of the traditional planning process. These studies provide detailed cost information necessary for designing rates, showing cost differences among rate classes, unbundling rates into separate functional components, pricing special services, developing economic development incentives, responding to customer rate inquiries, and establishing line extension policies. This article explores the many benefits of cost of service studies and shows why a utility should assess on a regular basis what it costs to provide service to its various classes of customers.

What is a Cost of Service Study?

A Cost of Service Study ("COSS") is a study in which the total company cost to provide electric service is spread or allocated to the customer classes. More particularly, the COSS is an analysis based on historical costs during a 12 month test period, which allocates the utility's costs to its customer classes as fairly as possible based on their consumption patterns. The COSS process starts with overall expenses and revenues, in total and for each rate class, as well as plant in service and depreciation data, and then calculates the rate of return on rate base (or rate of return on revenue) in total and for each rate class, and allows for a relative comparison of the contribution of each rate class to utility margins. In short, the COSS (a) takes all of the utility expenses and shows how those costs are attributed to the various customer rate classes, and (b) takes the rate class revenues and shows how much each rate class contributes to the overall utility margins. The COSS and Rate Design process is illustrated in Figure 1.

In terms of output, the COSS:

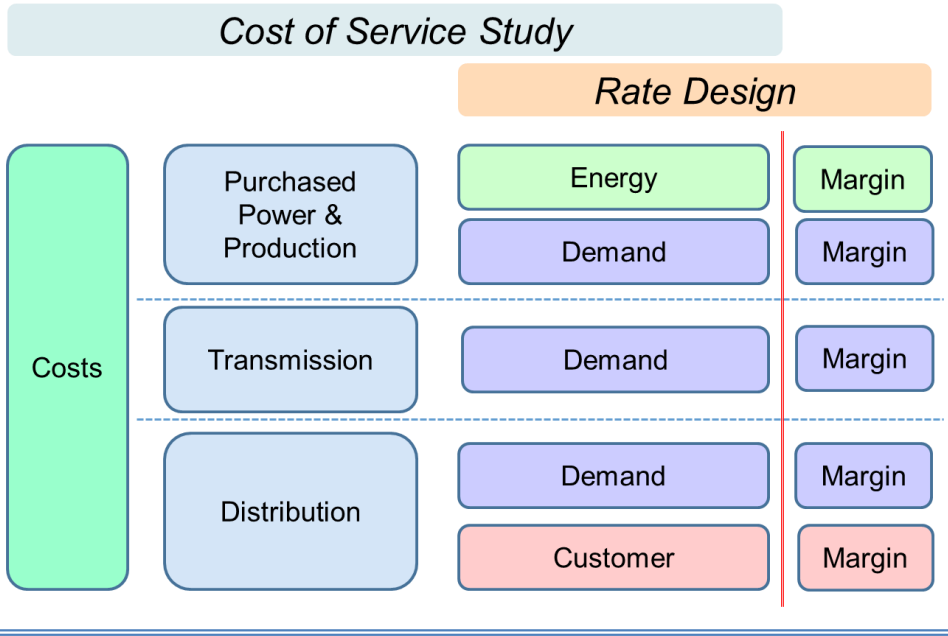
- Shows overall utility margins and rate of return;
- Shows margins and rate of return for each customer class;
- Shows differences in rates of return and thus cross-subsidies among customer classes;
- Provides detailed cost information necessary for developing rates;
- Provides "average customer" information for each class.

Using the COSS for Rate Design

The COSS identifies the costs incurred to serve each rate class, plus margins, such that each rate class makes an equivalent contribution to the utility's overall return. The rates that recover these costs are called "cost-based rates" and set the ideal target for rate design for the customer classes.

Most utilities use the COSS as a guide for designing rates, to ensure that each rate class pays its fair share of the utility's costs and margins.

Figure 1. Cost of Service Study and Rate Design Process



Subsidization Among Rate Classes

The COSS identifies the rate classes that are contributing more than their fair share of overall system returns, and those rate classes that are contributing less than their fair share. Any rate class with a rate of return that is less than the overall system rate of return is being subsidized by any rate class with a rate of return that is greater than the overall system rate of return. This relative rate of return comparison allows the utility to adjust rates so that the *subsidized* rate classes can begin to pay more and the *subsidizing* rate classes can pay less – moving all rate classes closer to cost-based rates.

Unbundling Electric Rates

The COSS shows the costs by rate class by the functionally-classified components. For each rate class these include:

- Production & Purchased Power - Demand
- Production & Purchased Power - Energy
- Transmission - Demand
- Distribution - Demand
- Distribution - Customer

Each of the components includes a cost element as well as a margin element. Ideally, a distribution utility (i.e. any utility that does not operate power plants or transmission facilities but instead buys power from a wholesale provider for distribution to its retail customers) will recover all margins through the Distribution Demand and Distribution Customer charges, and not through the other components. This allows purchased power costs to be a straight pass-through with no margin, removing any consumption-related incentives for both utility and consumers. This also insulates the utility from the financial impacts of extreme weather, retail choice, conservation, and energy efficiency.

Pricing for Customers with Generation

The COSS identifies the cost associated with each of the functional components (Production, Transmission, and Distribution) and by classification (Demand, Energy, and Customer). This allows the utility to show which costs are avoided when a customer self-supplies via on-site generation. The main component that is avoided when customers generate their own power is the Production Energy cost component. See Figure 1. Ordinarily, a residential customer with a rooftop solar implementation will not help the utility avoid any of the distribution costs, and may not help the utility avoid any production demand or transmission demand costs. (This may change based on the total number and capacity of customers with generation capabilities.) The same concept applies to industrial customers who are considering installing some on-site generation; the COSS permits the utility to provide production energy cost values (mostly driven by fuel) that the industrial customer can then compare to the costs of self-generating using various fuel alternatives (propane, gas turbines, etc.). Thus the COSS allows the utility to price its offerings to customers with self-generation in a way that correlates to the costs of providing service to those customers, and in a way that the customers can use to perform their own power supply comparisons.

Economic Development

The COSS can also be helpful for Economic Development Rates ("EDRs"). EDRs are basically discounted rates (or incentive rates) aimed at the attraction, retention, or expansion of large customers. As it does for all rate classes, the COSS shows the component costs (and margins) needed to provide service to large commercial and industrial customer classes. The COSS allows the utility to design an EDR deliberately—with knowledge of how much it costs to serve the average customer in those classes—so that the utility is aware of the economic impact of the discounted EDR on revenues. Also, a *Marginal* COSS should be performed to ensure that the *incremental* revenues derived from the EDR are not less than the marginal costs incurred to provide service to that customer. In a properly-designed EDR, the customer should make some contribution to fixed costs. Thus the utility will incur lost revenues but should not incur negative margins, and a Marginal COSS is used to show that the rate design is sound.

Line Extension Policies

The COSS shows the total distribution cost for each rate class and in total. The average plant investment per customer is the level of investment that existing rates will support. This means

that a utility can use the total distribution costs to calculate the average distribution plant investment per customer, and use that average cost per customer to establish the amount that the utility should be willing to invest to connect any new customer to the distribution grid. This amount is ordinarily set forth in the utility's Line Extension Policy. Line extensions that cost more than the average can be recovered from customer through a Contribution in Aid of Construction ("CIAC"). This stabilizes distribution costs and allows the utility to operate in a non-discriminatory manner with respect to new customers and CIAC charges.

Other Applications

The COSS can also be used for establishing High Load Factor rates ("HLF"), Time of Use or Time of Day ("TOU" or "TOD") rates, Real Time Pricing ("RTP"), or any other pricing structure that requires a breakout of electric service costs into its components. The COSS can also be used as a benchmarking tool to compare utility costs and utility cost recovery to other utilities or to a single utility over different time periods.

Frequency

Utilities should initiate a COSS every few years to assess whether the existing rates are sufficient to recover utility costs and margins, and to reduce subsidization among the rate classes. This will help the utility to remain financially sound and promote equity among the utility customers.

Conclusion

The COSS provides a functionally-classified allocation of utility costs to the rate classes, which is very useful financial information for managing the utility. The COSS shows which rate classes are being subsidized, which rate classes are providing subsidies, and by how much. This information can be used for designing rates, for pricing special services, and for creating incentive rates. The COSS can also support rate unbundling, customer inquiries, and line extension policies. This makes the COSS a valuable utility planning tool that should be performed every few years.

Don't wait for a crisis. Utility managers should incorporate the Cost of Service Study into the regular planning process and begin to realize the many benefits that these studies provide for the utility and its customers.

John Wolfram is the founder of Catalyst Consulting LLC, a consulting firm specializing in rate and regulatory matters for utilities. Contact the author by phone at 502.599.1739 or by e-mail at johnwolfram@catalystcllc.com. See other articles at www.catalystcllc.com