Economic concerns about high fixed charge pricing for electric service

The combined impact of a slowly growing economy, increasing adoption of energy efficiency measures and noticeable penetration of customer-sited power generation has kept utility sales in check in recent years. Many utilities suggest that improper pricing of their service is exacerbating this situation.

Pricing to signal the long-run cost of electricity use

When setting residential rates, regulators typically have two tools at their disposal—a variable (volumetric) charge that applies to electricity consumed and a fixed charge that applies to each customer regardless of electric use. A key aspect of utility pricing involves allocating costs to each component. Changes in electricity use have no effect on costs the utility previously expended to build its power plants, transmission lines and substations—those fixed costs are sunk. The efficient volumetric price reflects only those costs that vary with usage. But that notion can be misleading. The relevant economic costs are those that vary over the long run, not the short run.

The practically achievable benchmark for efficient pricing is more likely to be a type of average ***long-run*** *incremental cost, computed for a large, expected incremental block of sales, instead of a* ***short-run*** *marginal cost, estimated for a single additional sale.*[1]

In the long run, all costs are variable.[2] While increased electricity use does not affect the cost of *existing* capacity, it very well may affect the need for *new* capacity. If regulators want to promote efficient resource allocation they will set the volumetric rate above short-run variable costs to reflect full long-run cost causation. This pricing concept is not unique to utilities. Economists observe similar results in unregulated competitive markets where sustainable prices lie noticeably above short-run variable costs.[3]

Which costs belong in the customer charge?

When economist Severin Borenstein looks at the utility system through an economic lens he doesn't see a significant role for a customer charge in recovering utility fixed costs. He asks which costs the utility incurs in the process of merely connecting the customer to the system. In completing the connection, the only costs are those associated with billing administration, the meter and the service drop.[4] Cost studies suggest these distribution costs amount to about $5 per customer per month for the typical electric utility.[5] All other costs depend on usage characteristics. A new 5,000 sq. ft. home requires more system capacity than a new 500 sq. ft. efficiency apartment. Given a choice between the fixed charge and the variable charge, the volumetric charge is the more appropriate home for those capacity costs.[6] If instead they are allocated to the fixed charge, the signal is that all residential customers require the same amount of system capacity, regardless of the size of their residence.

The push for high fixed charge pricing

There is currently much interest in implementing utility pricing based on existing fixed-variable cost relationships. In contrast to the economic pricing approach, these proposed rate designs recover only average short-run variable costs in the volumetric fee, allocating all existing fixed costs to the fixed charge. Under this approach we see fixed charges as high as $70 to $80 per month, with associated variable charges in many cases of only a few pennies per kWh.

What signal does high fixed charge pricing send?

We can illustrate the drawback to such pricing with a simple scenario. With most costs recovered through the fixed charge, customers would receive the signal that increasing the cooling output from an air conditioner on a hot summer day creates no capacity costs for the utility, either in the short-run or the long run. In fact, this pricing implies that the utility never has to add capacity. That is inaccurate and if economic notions of price elasticity[7] have any meaning, moving from traditional pricing to high fixed charge pricing will lead to increased consumption in all periods, including the peak. As peak load grows the utility will then eventually add more capacity and charge the associated costs to their customers, even though the customers never received a price signal to that effect.

Is high fixed charge pricing fair?

American Electric Power finds that high fixed charge rate designs: (1) improperly allocate costs within rate classes, adversely affecting small users; (2) weaken price signals to consumers, reducing the incentive to use energy efficiently; and (3) rest on ill-defined notions of costs.[8] After assessing all the shortcomings of high fixed charge pricing, it concludes:

We believe that there are a host of alternative regulatory strategies that are far more flexible and more closely aligned with traditional regulatory practices.[9]

High fixed charge pricing negatively impacts low users, many of whom are low-income customers. Under this approach the bill for those using less than the average amount of power is higher than the bill they receive under traditional pricing. But since the fixed fee represents the bulk of the monthly bill, and that fee doesn't change with usage, customers can't do much to lower their bill.

Better pricing approaches

Rate design serves multiple purposes and there is room for innovation and compromise on this issue. Some alternatives come to mind. For example, time-differentiated pricing applies a high volumetric rate when the system is near capacity, and a low rate when demand is more limited. A recent preliminary decision at the California Public Utilities Commission finds that time-of-use rates are more cost-based than any flat volumetric rate.[10] Under this approach customers would get the correct signal that ramping up the cooling output from an air conditioner on a hot summer afternoon may increase the need for new capacity over the long run.

The minimum bill approach is another possibility. Under this rate design, the utility might charge $0.10 per kWh for all electricity consumed. There would be no explicit fixed charge, but all customers would pay at least a threshold amount, say $20 per month. A customer using 100 kWh would see a bill of $20 because the volumetric-based charge of $10 would be less than the minimum required level. In contrast, a customer using 500 kWh would simply then pay $50, all of which is usage related, because that amount exceeds the minimum threshold. While the minimum bill may overstate the customer-specific fixed costs to some extent, the Regulatory Assistance Project's Jim Lazar explains the advantage of this approach over high fixed charge pricing. We can see the proper economic pricing foundations in his description:

A minimum bill rate design has an advantage in that the per-kWh price is higher, more closely reflecting long-run marginal costs (all costs are variable in the long run). This rate design encourages prudent usage, better aligned with investment impacts from consumption and investment in energy efficiency. This means customer choices about usage and, importantly, energy-related investments, will be informed by electricity prices that reflect long run grid value.[11]

Summary

As utility markets become more complicated, regulators will be exploring new pricing approaches. High fixed charge pricing steers the economy away from efficient resource allocation, not toward it. Time-differentiated rates and minimum bill approaches offer more promise for regulators interested in sending proper signals about the long-run cost of electricity consumption. ■

[1] Kahn, *The Economics of Regulation,* MIT Press (1988), p. 85.

[2] Varian, *Intermediate Microeconomics,* W.W. Norton & Co. (2014), p. 391.

[3] Hall, "The Relation Between Price and Marginal Cost in U.S. Industry, *Journal of Political Economy* (1988).

[4] Borenstein, "What's So Great About Fixed Charges," Energy Institute at Haas, November 2014.

[5] Lazar, *Rate Design Where Advanced Metering Infrastructure Has Not Been Fully Deployed*, Regulatory Assistance Project (April 2013), p. 26.

[6] Another approach is to use a demand charge, which levy a fee based on use at a given point, not on cumulative use over time. To send a proper cost signal, however, those charges must be based on the customer's use at the time of the utility's system peak (coincident demand), and not based simply on the individual customer's peak usage. That approach is not addressed here because designing proper demand charges is a challenging task and great care must be taken when doing so to avoid price distortions and unfair outcomes.

[7] *Price Elasticity of Demand for Electricity: A Primer and Synthesis*, Electric Power Research Institute, January 2008.

[8] American Electric Power Company, *Issues in Electricity: Straight Fixed Variable*, 2014.

[9] American Electric Power Company, *supra*.

[10] *Proposed Decision*, Rulemaking 12-06-013 Before the California Public Utilities Commission, April 21, 2015, p. 117.

[11] Lazar, *Electric Utility Residential Customer Charges and Minimum Bills*, Regulatory Assistance Project, 2015, p. 4.

About the author

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