Demand Charges from a Regulatory Perspective

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1. ***Utility ratemaking has certain core objectives that regulators have adhered to over several decades.*** These objectives include a financially healthy utility, rates reflecting a prudent utility, fairness across customers and economic efficiency. One desirable outcome is to balance the interests of different stakeholders so as to advance the public interest. Thus, regulation tries not to unduly favor one interest at the expense of others. One question that regulators will inevitably ask is how demand charges in residential tariffs affect these objectives. Ultimately, they will ponder whether a rate design with demand charges represent "just and reasonable" rates, whose definition has broadened in recent years. (This session is specifically about rate design, which is the third leg of ratemaking.)

2. ***History has shown that regulators do adapt to a changed market, technological and political environment by giving their support to new rate designs and ratemaking mechanisms.*** Changes occur when the political equilibrium has been disrupted (i.e., stakeholders are so unsatisfied with the current situation that they expend substantial resources to change the status quo). But don't expect regulators to take drastic action without first having a good idea of the effects. Regulators usually prefer a gradualist approach to rate design and ratemaking. After all, the legacy of utility ratemaking is average-cost pricing or rates based on historical embedded cost; two important reasons are stable prices for consumers and financial stability for utilities.

3. **The context for this session is electric generation behind the meter (e.g., rooftop solar), where the ability of utilities to continue recovering fixed costs, which their regulators had previously deemed prudent, is jeopardized.** The question is then how the utility can recover those costs and from whom, presuming that regulators agree that utilities should continue to recover them. The fundamental problem is 2-part tariffs that place a large share of a utility's fixed costs in the volumetric charge; i.e., rate design is not aligned with the cost structure of utilities. Utility pricing has always reflected cross-subsidies benefitting certain customers at the expense of other customers. For example, socializing certain costs and bestowing upon some customer classes and utility services subsidies. This pricing was sustainable as long as utility customers were dependent upon

the utility system for virtually all of their power. With increased competition at the retail level, it becomes more imperative to align prices with costs (analogous to the railroads and telecommunications industries when they started to face competition). Ratemaking is crucial as it affects a utility's incentive to accommodate or promote DG, the economics of DG and the well-being of non-DG customers.

4. ***Regulators have various ratemaking options other than demand charges (e.g., status quo, interconnection fee, VOST, SFV, separate DG customer class, revenue decoupling, PURPA model) in response to the growth of DG.*** They all have different effects on the various stakeholders. For example, net metering and current rate design (with some increase in the customer charge) has the problem of utilities overpaying for surplus power from the DG customer and under-collecting recovery of fixed costs from the DG customer. SFV has drawn much opposition from various stakeholders for being anti-conservation, anti-low-income, and anti-solar; it is economically inferior to incorporating a demand charge in tariffs but is arguably efficient in the residential market. The job of regulators is to distinguish between legitimate ratemaking reforms for the public good and proposed changes driven by narrow interests. Regulators should rise above interest-group opposition to consider the overall public-interest effect.

5. **Overall, when compared with the other options, demand charges have positive features that align with core regulatory objectives** (*see* the last page). Nevertheless, some stakeholders may find problems with demand charges that would delay their implementation. Some contend that they would weaken price signals and that many customers would not lower their billing demand. Even some economists favor time-variant pricing over demand charges – they consider demand charges a "second best" form of peak load pricing, but with a similar effect when customer's peak occurs at the same time as the system peak.

   Implementing RTP and demand charges for utilities with smart and other advanced meters seem sensible, but one thing that I have learned is that good politics always win out over good economics: Only if these rate mechanisms are politically acceptable will we see them in common practice. What we can draw from the past is that changing rate design can be challenging even when the evidence and logic show that it is in the public interest, at least from the perspective of welfare economics; inevitably, however, there are winners and losers. Because it is a radical change in setting rates for residential customers, demand charges for residential customers will require time to gain acceptance from different stakeholders (education and the need for more evidence on the effects of demand charges). Still, the burden should be placed on those who want to sustain the status quo in rate design, especially in view of smart and other advanced technologies, changing market conditions, and new public policies.

6. ***Finally, it might be advised to do a zero-based review of rate design****:* Go back to square one and think about how rate design should be done in view of the growing penetration of DG and other features of today's electric industry. Current rate design, I believe, needs a thorough review if not revamping. Even in the absence of advanced meters, utilities should look at what portion of their demand-related costs they should recover through the volumetric charge versus the fixed monthly customer charge. Also even if DG fizzles,

utilities and regulators should work together to consider exploiting the potential benefits from advanced technologies through time-variant pricing and the inclusion of demand charges in residential tariffs. Ratemaking has evolved over time to accommodate new technologies, new market conditions and changed public policy goals.

Good Features of Demand Charges

1. Address head-on a rate design problem that currently exists and that has become more pronounced over time

2. Increase load factor (provide an incentive for customers to lower their KW demand)

3. Rightly divide fixed costs into two categories: system-wide and customer- specific (How about utilities that don't have maximum monthly demand reading capability? The question then becomes how much demand-related costs should be recovered through the energy charge versus the fixed monthly customer charge)

4. Provide customers with better price signals (e.g., move volumetric charge closer to utility's variable costs)

5. Could mitigate a death-spiral-type tendency occurring under an alternative rate design that would allocate revenue shortfalls to non-DG customers (e.g., revenue decoupling)

6. Reduce the cross-subsidy that relatively low load-factor customers currently enjoy

7. Advance fairness in terms of who should pay for the utility's embedded capacity costs (at least from a retrospective rather than prospective perspective; e.g., a charge attached to a customer's bill for utility's readiness to serve, on demand rather than reflecting the utility's marginal capacity cost)

8. Help low-income customers, assuming they are also low-usage customers, when compared to increasing the customer charge (e.g., the latter results in the same reallocation of capacity costs to all customers irrespective of what capacity cost they impose on the utility; it is expected that high-usage customers impose a higher system-wide capital cost)

9. Can provide better calculation of the capacity value of DG power sold back to the utility

10. Can improve the economics of energy storage

11. Come across as an equitable and efficient (if implemented correctly) way for utilities to recover their capacity costs; fairness suggests that the allocation of costs to customers would correspond to the services consumed, both energy and capacity (service on demand or reliability which requires capacity)

12. Can lead to an **ideal rate design**: *volumetric charge* based on variable cost, *customer charge* based on customer-specific fixed costs (billing, metering) and a *demand charge* based on system-wide fixed costs (how about for utilities without advanced meters?)