

CROSS-SUBSIDIES:

Getting the Signals Right

Should regulators care about the inefficiencies?

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Illustration by Alex Stephen

With the first wave of legislative utility deregulation largely complete, the bulk of market restructuring is now happening in the much less public, but just as important, realm of utility rate-making proceedings. Inside these proceedings, utility commissioners address the basic economic and contractual framework for electric utility services.

By setting the absolute rate and the rate structure under which electric service is provided, these proceedings affect all future capital allocation in the electric sector on both sides of the meter. Where the first wave of deregulation focused on wholesale power markets, this second deregulation wave directly affects retail markets. It is therefore critical that regulators carefully consider the long-term impacts of the proposed rates on the broader retail market.

Within these proceedings, commissions strive to avoid cross-subsidization of one ratepayer by another. Economic theory teaches that optimal economic efficiency occurs when costs and benefits are aligned, and thus cross-subsidization is widely considered a symptom of economic inefficiency to be avoided in utility rate design.

But is a dogmatic opposition to cross-subsidies appropriate? We argue that it is not. Step back in time for a moment and ask yourself a question: Why did society decide to create regulated utilities? Given the free-market, competition-friendly principles on which our economy is based, why did we decide years ago to grant monopoly rights to the electric, gas, airline, railroad, and telephone industries?

There are many answers to this question, but all ultimately derive from a belief that the benefits created by these utilities were too important to be left to the vagaries of a free market. Would a profit-seeking business electrify rural areas or expedite repair crews in the middle of an ice storm? In the early part of the last century, Samuel Insull convinced the Illinois state legislature they would not, and negotiated for his utility to guarantee service in exchange for a regulatory cap on profits. Other states rapidly followed, and today all utility regulators grapple with the same conundrum: how to respect the integrity of a for-profit, private business while at the same time ensuring that those businesses deliver the public benefits for which they were created.

But look at the implication: The reason we have regulated utilities is to create cross-subsidies. The first rural customer did not have to pay the full cost of stringing transmission cables to the home, and a customer in an ice storm is not expected to pay overtime fees to the linemen reconnecting the system the next day. In all cases, the costs of such services are subsidized by other ratepayers. Indeed, the cross-subsidization concept is found throughout utility rates: From discounted rates to low-

income families to systems benefits charges, there are huge swathes of customers who pay less than their full cost of service, thus being subsidized by other customers who pay more to make up the difference. We tolerate and encourage such rate setting out of the belief that the social benefits created by such subsidization outweigh the resulting economic inefficiency.

In this context, one cannot logically claim that cross-subsidies are uniformly good or bad. They are put in place to achieve certain economic, social, and political ends. While we might disagree with the application of a particular cross-subsidy, our opposition is based not on the cross-subsidy *per se*, but rather on our judgment about the worthiness of those socio-political goals. To put it bluntly, one cannot be categorically opposed to cross-subsidies and categorically in favor of regulated utilities. The latter exists to provide the former.

Since utilities were founded to create cross-subsidies, it's not surprising to see an on-going creation and maintenance of cross-subsidies throughout electric rate structures. Many cross-subsidies receive little objection or notice from the general public, showing just how prevalent they are. For example:

- **Geographic diversity within the same rate class.** Utility rates often cover all customers in large swathes of geography. Similar to postage stamps, the price of service is the same if the end-user is located in an urban center or rural county. The rates are constructed and applied without regard for the higher system costs in congested urban areas and higher maintenance costs in remote rural areas. Thus, low-cost, high-profit customers are implicitly subsidizing high-cost, low-profit customers.
- **No real-time prices.** With a few notable exceptions, users do not pay for the actual wholesale market price of generation but rather for the average costs over a year. While many users have divergent on- and off-peak rates, this is set in advance and does not have any direct bearing on the actual costs of service at any given time. Thus, consumers who demand more power during peak hours when only the most expensive generators are available (and line losses are at a maximum) are being directly subsidized by those who consume most of their power during shoulder or non-peak pricing periods.
- **System-benefits charges.** Many states have created system-benefits charges, assessed to all consumers so as to fund a variety of energy-efficiency and renewable-power projects. Many ratepayers contribute to these programs, but the select few who gain access to the funds realize the primary financial benefit.
- **Standby rates.** Standby rate proceedings for on-site generation are theoretically based on the costs imposed by the generator on the grid, but they rarely, if ever, take

into account the benefits created for the grid by the generator (e.g., reduction in grid congestion, reduced demand for power plant fuels, etc.). By ignoring one side of the ledger, these rates are guaranteed to overcompensate the regulated utility at the expense of the ratepayer with on-site generation.

■ **Inter-class subsidization.** It is widely known that the profitability of commercial customers tends to be higher than residential or industrial rate classes, since commercial classes do not have the political leverage of residential interest groups, nor the financial leverage of large industrials that can self-generate and leave the system if rates get too high. Such differences imply a cross-subsidy among these rate classifications.

■ **Intra-class subsidization.** Since all rate classes are devised from the average of many customers, there is necessarily a subsidization that exists between customers on either side of this average. This can create substantial cross-subsidization if the class encompasses a broad range of sub-segments that pay significantly different prices for similar utility services (see *Appendix for details*).

So, are any of these existing cross-subsidies categorically bad? The answer ultimately depends on the answers to two questions:

1) Are the benefits created by the subsidy larger or smaller than the subsidy itself (e.g., does the presence of the subsidy create a macroeconomic benefit)?

2) Can the costs be better allocated to those who realize the benefits (e.g., is the subsidy fair)?

These questions are easy to ask, but they can be intellectually and politically difficult to answer. Intellectually, how does one put a dollar value on the benefits of renewable energy? Politically, what level of rate support for low-income families is too high?

What the Industry Should Do

To help regulators address these issues in a more logically coherent and politically constructive way, we offer the following recommendations:

Recommendation #1

Consider a hierarchy of cross-subsidy value.

As has been demonstrated herein, there is no simple answer to the question of whether cross-subsidies are good or bad. However, there are a few cases where one can still be dogmatic. When first considering a potential for cross-subsidization, regulators should assess which of the following three categories the cross-subsidy falls into, and they should respond accordingly.

1) **Beneficial cross-subsidies.** These cross-subsidies exist to create a value that would otherwise be missed by purely

market-driven companies. These are easy to identify in theory but hard to pin down in practice. For example, while no one would argue that one should not provide lower-cost electricity to low-income customers, reasonable people might disagree about the best mechanism to achieve those goals. Other examples of such cross-subsidies include system benefits charges to support renewable energy technologies. We recommend that regulators treat such subsidies as beneficial, but revisit them on a regular basis to ensure that they are always using the best regulatory tool to achieve a given objective.

2) **Harmful cross-subsidies.** Two cases exist in which a cross-subsidy is universally bad for society: in the case of discriminatory pricing¹ and in the case where the cross-subsidy benefits a utility's shareholders at the expense of their customers. The former describes any circumstance wherein a given customer class is given a higher rate than other customers with identical cost structure. This describes most standby rates, which are calculated based on the cost of a grid outage, but do not apply equally to other customers with comparably peaky load profiles (e.g., the standby rate creates less financial impact on the utility than the variance already tolerated as part of intra-class cross-subsidization). The latter describes any situation where the rate increases utility profits at their customers' expense. This describes all cost-plus rates, which gives utilities a vested interest in increasing their cost of service.

3) **All others.** If the cross-subsidy cannot readily fit into one of the two categories above, one cannot justifiably take a dogmatic position in support of, or opposition to, the cross-subsidy.

Recommendation #2

Use market-based mechanisms to encourage good behavior wherever possible.

The best regulations give market participants a vested interest in society's success. However, the legacy of regulations designed to ensure that utilities do not earn unfair profits have made most utility regulations quite proscriptive, incorporating many sticks but few carrots. Current rates are rife with opportunity for more market-driven efficiency, from cost-plus rate making that discourages cost-control measures and encourages inefficiency, to the lack of transparent price signals that could guide end-users in rationalizing their energy demand during peak-pricing periods.

Indeed, many benefits that existing cross-subsidies are designed to create can be achieved more efficiently with a market-based approach. For example, many service quality protocols penalize utilities for failing to deliver some base level of

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grid reliability, but they provide no financial incentive for exceeding those targets. This necessarily encourages a lowest-common-denominator approach to reliability planning. Instead, why not allow utilities to earn a greater rate of return on their system assets as their system reliability increases? Better yet, why not link that to the return they earn on depreciated assets so as to provide an incentive to seek reliability in the most capital-

ning process, it is a virtual certainty that commissioners will approve too many over-expensive (but regulated) wires and too few cost-effective (but unregulated) generators to serve future load growth. Thus, the legislature's objective to inject competition and reduce electric costs is implemented through a planning process that relies exclusively on the services of a single regulated utility and conspicuously fails to include many of the most cost-effective mechanisms to serve a growing load.

Many similar disconnects exist between utility rates and environmental policy, which on the one hand reward utilities for selling more power (and thus burning more fuel) while on the other encourage emissions reduction through end-user conservation. When environmental stimuli take the form of demand-management programs, there is a truly perverse cross-subsidy created wherein the utility's cost-plus pricing encourages the maximum sale of the least efficient generation, and the profits are then used to support reduced consumption by their customers.

These inconsistencies constrain the state's ability to realize its policy objectives, and they all too frequently lead to utility rates that encourage exactly the opposite behavior sought by other state agencies.

Recommendation #4

Make a conscious effort to include benefits created by ratepayer actions in ratemaking proceedings.

Given their focus on ensuring utility cost recovery, ratemaking proceedings tend to ignore or understate the benefits some ratepayers provide to the system. From load shedding to VARs support, customers can and often do take numerous actions that reduce utility costs. Unfortunately, these actions are rarely if ever considered in rate proceedings. Nobel laureate Vernon Smith has spoken frequently on this topic, and notes that it is a flaw common to virtually all regulated industries.²

By failing to include benefits in their calculus, these rate proceedings guarantee that unfair cross-subsidies will be created because customers will be penalized for the costs they impose but ignored for the benefits they create. This type of regulatory failure is particularly prevalent in rates associated with on-site generation, since the benefits resulting from load congestion, emissions reduction, and power-factor correction are almost never factored into cost-based proceedings.

This Achilles' heel makes regulators at best blind to, and at worst discriminatory towards, customers who seek to create benefits for the system. Regulators can overcome this limitation by clearly defining the benefits sought, identifying technical means to create those benefits, and ensuring such technologies are encouraged—or at least not discouraged—in subsequent rate proceedings.

effective way possible?

The absence of such incentives in the regulated utility sector forces ratemakers to encourage these benefits through less efficient means, and the creation of such measures often leads to debates over cross-subsidies and their socio-political goals. It is much better to get the market signals right, and then allow businesses to respond accordingly.

Recommendation #3

Consider the goals and objectives of other regulatory agencies when crafting utility rates.

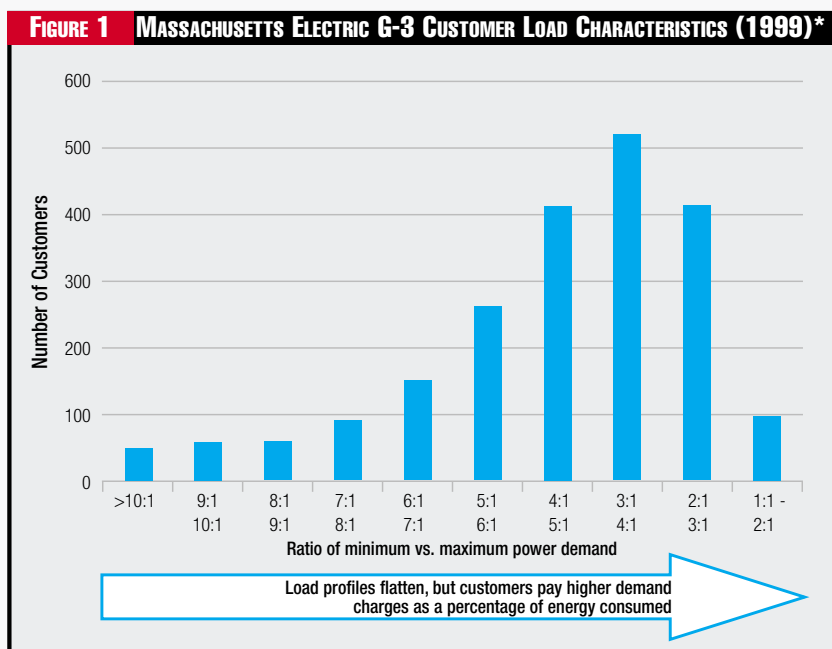
Utility regulators should establish broad goals that are consistent with goals of other state officials, and then craft rates that are consistent for all. Too often, rate cases are narrowly focused on the acceptability of a particular rate and are thus structurally unable to address broader state objectives. Commissioners typically have neither the time nor the resources to ask how rates could be best designed to achieve state policy objectives when they are instead focused on the minutiae of accepting or rejecting specific rate filings. This leads to a multitude of utility rates that stand in direct opposition to broader state policy goals, and no controlling authority exists to rectify the inconsistency.

As an example, consider utilities that have been "unbundled" through legislatively-mandated deregulation so as to promote competition in the electric sector. In many cases, the resulting distribution utilities are no longer permitted to own generation assets, but commissioners still (reasonably) insist that such utilities take a "least-cost approach" to planning future load growth. By exempting generation from the plan-

APPENDIX

To better illustrate heterogeneity inside a rate class, consider the following data from Massachusetts Electric. The data shown is for all customers on the utility's G-3 rate, and it plots the ratio of the minimum and maximum power demand over the 1999 calendar year. As this ratio falls, customer-load profiles become flatter, while those at the other extreme have infrequent load spikes. These ratios are an expression of a customer's load factor as measured by the peak-demand charge on 12 months of utility bills. Consider how the rates for this customer class were set. Massachusetts Electric has fixed and variable

charges. Some variable charges scale with power usage (kW) while others scale with energy usage (kWh). Utility rate engineers looked carefully at the characteristics of this rate class and devised a structure including demand and energy charges to meet the needs of these customers and recover the costs of service. A customer on the far left side of the above graph has a peak monthly kilowatt usage that is 10 times its minimum monthly kilowatt usage over a calendar year (such as might be found in a mid-size apartment building with high summer cooling loads). This customer is paying relatively little in the annual demand charge even though the utility must maintain infrastructure to serve the customer all year long. At the other end of the spectrum, a customer on the same rate classification has a very flat load profile (such as might be found in an industrial facility where electric loads are driven by process requirements). These customers are paying much more per year for the same peak capacity needs than those at the other extreme. Thus, the rate design implicitly includes a cross-subsidy. —S.C.&J.M.



*Data extracted from public filings made in Massachusetts Department of Telecommunications and Energy case DTE 03-121. Details are available on the Web at <http://www.mass.gov/dte/electric/03-121/316teleseta.pdf>, p. 4.

Recommendation #5

Recognize that “cross-subsidization” is a charged term, and its use diverts attention from more important socio-political objectives.

As described earlier, cross-subsidies *per se* are neither categorically good nor bad, but serve as a means to achieve social, economic, and political objectives. They are an inherent feature of utility ratemaking, and exist by virtue of compromises made in the creation and maintenance of electric utility regulation. Discussion of cross-subsidization without discussion of those socio-political objectives is diversionary at best and deceitful at worst. Regulators are encouraged to disallow such testimony in their proceedings to steer participants toward a more relevant focus on the issues at hand.

This is not to suggest that regulators should ignore the issues surrounding cross-subsidies. From a purely economic perspective, there is an economic inefficiency inherent in any system with cross-subsidization, but society did not create regulated utilities out of a desire to achieve economic effi-

ciency. We created such entities out of a desire to achieve a broad slate of socio-political objectives, and cross-subsidies are to be opposed only to the degree that they interfere with our ability to realize those goals. ■

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Endnotes

1. Here and throughout, we use the term “discriminatory pricing” in the regulatory law context, as opposed to the economic context. The former frowns on any rate that charges a differential rate to two customers with identical cost structures, while the latter would argue that a customer's willingness to pay should be factored into this determination. The difference does not substantively affect the arguments espoused herein.
2. See <http://www.cei.org/pdf/3440.pdf>.