Are Standby Rates Ever Justified? The Case Against Electric Utility Standby Charges as a Response to On-Site Generation

Standby rates are not only unnecessary, but actually stand in direct opposition to the public interest. To allow utilities to apply standby rates to distributed generators is economically beneficial to the utility in question, but economically disadvantageous to society as a whole.

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I. Introduction

In recent years, the call for standby tariffs in electric utility rate structures has escalated as a response to the growing penetration of distributed generation (DG) on the utility grid. Though intended to ensure that the public benefit is not compromised, their actual effect has been—and will be—to increase the total cost of electricity to all power consumers.

This article outlines the economic basis for this argument and is intended to provide policymakers[1] with a tool to assess the full economic impacts of standby electric rates. While this article is focused on standby rates—wherein customers pay a flat monthly charge for potential, rather than actual, power provided—its logic applies equally to any rate component that tends to reduce the dependence of electric bills on variable electricity consumption and increase their dependence on fixed monthly charges.[2]

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This article will show that the counter-arguments in support of standby rates all fail for one or more of the following reasons:

1. A failure to include load growth in cost-recovery projections;
2. A failure to apply actuarial mathematics to the utility infrastructure, and;
3. A failure to design rates that maximize social—as opposed to utility—financial benefit.

II. Why Standby Rates?

To appreciate the cause for these failures, one must start by understanding the utility argument for standby rates, all of which boil down to the following two propositions.

A. Compensation to recover the costs of providing peak power

To a substantial degree, utilities' costs tend to scale with peak demand (kW) rather than annual electricity sales (kWh), since the former sets the size and maintenance needs for the most capital-intensive components of their traditionally configured system (central generating plants, transmission/distribution wires, substations, etc.). However, utility revenues tend to scale with electricity sales, on a kWh basis. As such, it has been claimed that the addition of a distributed generator will reduce utility revenues, but not significantly impact their costs, since it is assumed that the utility still must maintain peak service in the event of a generator outage. Utilities have thus argued that existing rate structures must be altered to correct this changing pattern of consumption.

B. Prevent cross-subsidization of non-DG customers

In this case, it is claimed that since utility profit margins are compromised by DG, the utility must be "made whole," or else be forced to raise rates to all other customers. Should this happen, non-DG customers will in essence be forced to pay for their neighbors' actions. Regardless of the economic accuracy of these assertions, these arguments create political and emotional arguments for the implementation of standby rates that are often extremely difficult for policymakers to effectively counter.

The underlying presupposition of all standby rates—that customers receive benefits from the utility system, but deliver no benefits in return—is categorically false for customers who install DG.

Both of these arguments are fatally flawed, but for subtly different reasons:

- The first fails to include the statistical realities of the electric grid and thereby overstates the actual revenue impact of an individual distributed generator on the much larger utility.
- The second fails to take into account the financial benefits that DG creates, which are often well in excess of their costs.
- Both arguments fail to account for the steady growth in electricity consumption, which creates an ongoing demand both for new wires *and* enhanced utilization of existing utility assets.

In short, ***the underlying presupposition of all standby rates is that customers receive benefits from the utility system, but deliver no benefits in return.*** This supposition is categorically false for customers who install DG. These customers can be shown to be directly responsible for an array of benefits that accrue both to their utility and to the society at large. In ignoring these benefits, standby rates thus overcharge DG customers for electric power *and* bring about financial penalties to our national economy by preventing the more widespread adoption of DG technology.

To understand why this is the case, let's take a closer look at each of the arguments in favor of standby rates as outlined above.

III. The Case Against Peak Power Cost Recovery

Like all businesses, electric utilities are obliged to charge for calculate the aggregate financial impact of a given DG installation on a given utility, which is best illustrated by example. Suppose that a 100 kW DG unit is installed. The actual reduction in utility resource utilization will be:

100 kW
X The distributed generator's coincident peak with the utility (expressed as a percent)
X The statistical likelihood of an outage, inclusive of all DG units that directly impact the asset in question.

These values can be calculated easily—and will always be less than the rated power of the generator. To categorically apply a standby rate to the entire peak power output of the generator is thus to overcompensate the utility for the services they provide.

IV. The Case Against Cross-Subsidization

Public utility commissions are—as their title suggests—tasked with regulating utilities in a manner that will deliver the maximum public benefit. While the fiscal health of a utility is *sometimes* a good proxy for the public benefit (e.g., a bankrupt utility cannot be reasonably expected to provide reliable electric power), this is not universally true. In fact, there are a broad number of social benefits—financial and otherwise—which accrue to society at large, but not to the regulated utility.

Many of these benefits can be generally classified as market externalities, which are notoriously difficult to monetize under any condition (reductions in air emissions, reductions in greenhouse gas emissions, reduced vulnerability to terrorist attacks, etc.). While policymakers are well advised to factor these into their planning processes, it is admittedly difficult to do so. However, there are many financial benefits delivered by distributed power generation that are easy to calculate but exceeding difficult to recover under existing utility regulation. Broadly speaking, ***these benefits arise in any instance where the distributed generator reduces the total cost of delivered electricity.*** So long as utilities rates are set under traditional cost-plus protocols, any actions that reduce utility costs also reduce utility revenues. (Note that society still realizes fiscal benefit from these measures—after all, it is the electricity consumer who ultimately benefits from any reduction in the cost of delivered electricity.)

Among the classes of financial benefits which can thus be delivered—and calculated—by distributed generation are the following:

- Any measures that increase the efficiency of power generation. If a customer generates electricity at twice the efficiency of the local utility, they will only have to purchase half as much fuel and realize immediate fiscal savings. However, if the utility invests in the same measure, they will be forced to pass these savings along to their customer, and show no net improvement in their financial position.
- Any measures that reduce the need for additional construction of transmission and distribution assets will offset (on average) over $1,300/kW of DG capacity installed.[5] This is shown in **Table 1**.[6] Society clearly benefits from such avoided investment, but the utility only realizes a reduced basis for cost-plus rate making (and hence reduced revenues).

Table 1: Marginal Costs to Serve New Load by Upgrading T&D Network

Grid Component	U.S. Average Cost ($/kW)
Transmission	$540
Substation	$39–211
Distribution	$720
Total	$1,299–$1,471

With many DG technologies—engines, steam turbines, gas turbines, etc.—already available at installed costs of less than $1,300/kW, it thus becomes abundantly clear that distributed generation is in many cases the cheapest way to deliver future load growth.[7] The obvious implication is that from a public policy perspective, it is in society's best interests to enhance the economics of DG—as opposed to the economics of the utilities

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simply "when?" Installation of end-user-sited generation does not render utility investments useless—it simply buys the utility critically needed time before they will have to upgrade the capacity of those investments.

This reality sets a very real "shelf-life" on the economic relevance of standby rate structures which (to the author's knowledge) has yet to be factored into any approved standby tariff. Unless one expects DG penetration to outpace future load growth, the entire concept of "stranded assets" thus becomes a misnomer. "Temporarily idled assets?" Perhaps—but certainly not stranded. As **Table 3** shows, we would require a national DG penetration of almost *13 GW per year* over the next 20 years simply to keep pace with the growth in electricity consumption.[10] Any penetration short of this level will have to be accompanied by a commensurate increase in transmission and distribution (T&D) construction—and thus with the steady overutilization of those (supposedly) stranded assets.

In other words, unless one expects these extraordinarily high levels of DG penetration to materialize in the very near future, there is no credible argument that can be made in support of standby rates. Rather than asking the question "can the utility afford to allow DG on their networks?" we should be asking "given our constrained electric distribution system, how can we best facilitate the spread of DG?" Standby rates—which reduce the economic viability of DG investments—are thus clearly a step in the wrong direction.

In fact, any measures that prevent the adoption of DG may also stand in opposition to the financial interests of the utility. To understand why, recognize that the trends shown in Figure 2 imply a steady aging of the installed base. This means that utilities' revenues are increasingly being earned on assets that have already been paid down. By deferring the need to invest in new assets, DG will thus increase the marginal profitability of utilities by allowing them to steadily increase that fraction of their revenue that is earned through fully amortized investments. By contrast, if we take actions that block the spread of DG, we will soon force utilities to make massive investments in the electricity T&D infrastructure, which would almost certainly lead to rising electricity rates to all consumers.[11]

Given these trends it is quite reasonable to assert that absent strong corrective action, we are on a crash course for disaster. There is no hyperbole intended by this statement. As reserve margins have fallen, we have steadily reduced our ability to move electric power into those places where it is most needed. Recent blackouts in Chicago, California, and New York City have all been caused not by a lack of generation, but by a lack of T&D capacity. In Chicago alone, the 800 deaths that directly resulted from power outages make this a larger social disaster than the Oklahoma City bombing, Northridge earthquake, and TWA Flight 800 crash *combined*.[12] This is a public policy disaster of the first order—and one which we have yet made no measurable effort to resolve.

In this context, policymakers should be doing everything in

Table 3: Actual Annual DG Penetration Required to Idle Utility Assets, 2003–2023

Region	Annual DG Installations Required to Idle Utility Assets, 2003–2023 (MW/year)
New England	281
Middle Atlantic	703
East North Central	1,719
West North Central	879
South Atlantic	3,311
East South Central	1,167
West South Central	1,807
Mountain	1,157
Pacific	1,946
Total U.S.	12,970

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Having made this case, it is worth noting that there are undoubtedly a number of exceptional cases in which case a DG investment will lead to significant stranded assets (e.g., if a customer installs DG immediately after a utility makes an investment in a large distribution capacity upgrade specifically for that customer's facility). However, this is an argument for allowing exceptions to existing tariffs—not for designing tariffs for exceptional circumstances.

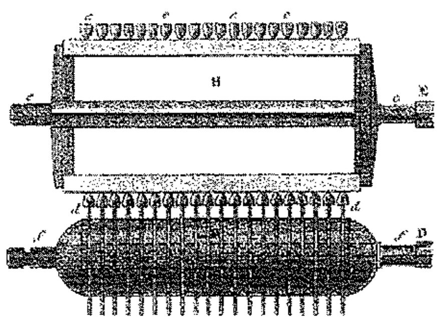
With the 20-year (and counting) trends all pointing in the wrong direction, the time has come for wholesale changes in the way that we regulate—and price—electric power. When the status quo equates to increasing line losses and falling reliability, our best course of action is to change the status quo—not to add standby rates that will serve only to keep it in place.■

Endnotes:

1. This term is used generically throughout this article to refer to public utility commissions and legislators—all of whom have a direct role to play in the regulation of monopoly utilities.

2. This includes demand ratchets, increasing customer charges as well as many blatantly anti-competitive rate elements like aptly named "customer retention discounts" approved by the Hawaii PUC or "load retention tariff" proposed by Commonwealth Edison.- Gary Nakarado (National Renewable Energy Laboratory), via personal correspondence, provided information on "customer retention rates" and other more egregious examples of anti-competitive rate-making by utilities and rate commissions. Among the examples he has identified are the following:

- *Colorado:* Public Serv. Co. v. Trigen-Nations Energy Co., No. 98SA103, Supreme Court of Colorado, 982 P.2d 316; 1999 Colo. LEXIS 616; 1999 Colo. J. C.A.R. 3901, June 28, 1999, Decided.
- *Hawaii:* Report Submitted to the Legislature Pursuant to S.C.R. 98, S.D. 2 Requesting a Consideration of the Feasibility of Opening a Public Utilities Commission Docket Relating to Standby Charges and Customer Retention Discounts, State of Hawaii Public Utilities Commission, Dec. 2002.
- *Illinois:* Citizens Util. Bd. v. Illinois Commerce Comm'n, 275 Ill. App. 3d 329.



3. A grid with n interconnected generators will have a reliability of $1 - X$ percent^n, where X is the probability of an unplanned outage on any individual generator at any given time. Most DG technologies have reliabilities of 95 percent or higher, meaning that just 5 interconnected generators will have a system reliability of 1–5 percent^5, or 99.99997 percent. By comparison, the U.S. electric grid has an aggregate reliability of approximately 99.99 percent.

4. To take just two examples, photovoltaics produce peak power only during mid-day, and many combined heat and power plants produce peak power during times of peak thermal demand without regard for relative electric consumption.

5. It is worth noting that the lion's share of this avoided expense arises on the downstream end of the T&D system, as these are the investments that will be most directly impacted by any individual DG user.

6. Arthur D. Little, *Preliminary Assessment of Battery Energy Storage and Fuel Cell Applications in Building Applications*, Final Report to National Energy Technology Laboratory, Aug. 2, 2000.

7. Thomas R. Casten and Martin Collins, *Optimizing Future Heat and Power Generation*, COGENERATION AND ON-SITE POWER PRODUCTION, Nov./Dec. 2002, 3 (6).

8. Department of Energy, Energy Information Administration, ANN. ENERGY OUTLOOK 2000, Washington DC, 2000.

9. Eric Hirst, *Transmission Planning for a New Era*, Jan. 2002, available on Web at http://www.ehirst.com/PDF/TXPlanning102.PDF.

10. Calculated simply as the growth in electricity consumption shown in Table 2 converted into MW based on a 6,000 hour operating year. Actual penetration requirements would be slightly higher than that shown here due to utility backup requirements (see Casten and Collins, *supra* note 7, for a more rigorous calculation).

11. Eric Hirst has estimated that simply to maintain a transmission (e.g., exclusive of distribution) reserve margin consistent with 1999 levels will require an investment of $56 billion from 2000 to 09, at a cost of approximately $1,000/kW of delivered service. (Hirst, *supra* note 9.) It is unrealistic to expect utilities to make these investments without also filing for a formal rate case to increase the electric rates paid by all consumers.

12. Eric Kleinenberg, HEAT WAVE: A SOCIAL AUTOPSY OF DISASTER IN CHICAGO (Chicago: University of Chicago Press, 2002).