Rate Design, Yardstick Regulation and Franchise Competition: An Integrated Approach to Improving the Efficiency of 21st Century Electric Distribution[1]

If there is any economic concept about which there can be said to exist a consensus, it is that regulation makes a poor, if sometimes unavoidable substitute for competition.[2] Monopolists, the saying goes, like the "quiet life." So much so, as the late professor Walter Adams often remarked, that regulated firms usually crave regulation's protections more than they resent its proscriptions.[3] To their immense credit, regulators in the last two decades have become more inclined to question the scope of natural monopoly and to embrace competitive solutions. To counteract the disadvantages of traditional regulation, regulators serious about encouraging economic efficiency have tried to foment competitive tumult wherever it is economically viable and to simulate the conditions of competition where it is not. This article focuses on the importance of efficient electric distribution in the post-restructuring era and how regulators can promote that efficiency by (1) protecting and encouraging franchise competition, (2) employing regulatory yardsticks, and (3) designing rate structures that send proper price signals

[1] © 1999 Harvey L. Reiter and Christopher Cook. Some passages contained in this article have been excerpted from Mr. Reiter's earlier article in the Energy Law Journal entitled "Competition Between Public and Private Distributors in a Restructured Power Industry," 19 Energy L.J. 333 (1998) and from Mr. Cook's article in the January/February 1998 edition of PowerValue Magazine entitled "Competitive Distribution Services in a Restructured Electric Industry." The authors thank those publications for the permission to use these excerpts.

[2] "Regulators are essentially incapable of assuring that performance will be positively good." 2 ALFRED KAHN, THE ECONOMICS OF REGULATION, 47; "The decision to regulate never represents a clean break with competition. No regulatory statute to the author's knowledge completely abandons reliance on competition as one guarantor of good performance." *Id.* at 113; STEPHEN BREYER, REGULATION AND ITS REFORM (1982); Leonard W. Weiss, *Antitrust in the Electric Power Industry*, *in* PROMOTING COMPETITION IN REGULATED MARKETS 145-46 (Almarin Phillips ed., 1975).

[3] WALTER ADAMS, THE STRUCTURE OF AMERICAN INDUSTRY (1986). See also, Robert L. Bradley, Jr., *The Origins of Political Electricity: Market Failure or Political Opportunism?*, 17 Energy L.J. 59, 61-64 (1996).

about the relative costs of expanding distribution plant and substituting distributed generation, conservation services or other alternatives.

The successful efforts of state and federal regulators to open up competition in the provision of long distance telecommunications services, the sale of telecommunications equipment and the sale of natural gas are, by now, widely known. Indeed, the sales of these services and products are now effectively deregulated. And, it is perhaps for this reason, that regulators of the telecommunications and natural gas industries have turned their attention to those sectors of the telecommunications and natural gas industries still characterized by natural monopoly conditions – or at least conditions where near exclusivity and rate regulation prevail. State regulators have, for some time now, been experimenting with incentive rate designs to encourage better performance by monopoly localdistributors.[4] Through its regulations implementing the Telecommunications Act of 1996 -- recently upheld by the Supreme Court[5] -- the Federal Communications Commission has also tried to foster competition in the provision of local exchange services. Similarly, the Federal Energy Regulatory Commission continues to push the advantages of incentive rate mechanisms as a means to improve economic performance by natural gas pipelines who otherwise face only

[4] See, e.g., Barbara R. Alexander, How to Construct a Service Quality Index in Performance-Based Ratemaking, The Electricity Journal 46-53 (April 1996).

[5] *AT&T Corp. v. Iowa Utilities Board*, No. 97-826 __U.S.__(January 25, 1999). The Telecommunications Act of 1996 (1996 Act) fundamentally restructures local telephone markets, subjecting incumbent local exchange carriers (LECs) to the obligation under 47 U. S. C. §251(c) to share their networks with competitors. LEC competitors can purchase local telephone services at wholesale rates for resale to end-users, lease elements of the incumbent's network "on an unbundled basis," and interconnect their own facilities with the incumbent's network. After the FCC issued regulations implementing the 1996 Act's local-competition provisions, incumbent LECs and state commissions filed numerous challenges. The Eighth Circuit upheld the challenges but the Supreme Court reversed, upholding the FCC regulations.

limited competition[6].

By contrast, little attention has been given to the way in which regulators will regulate electric utilities in the post-restructuring era. To be sure, the widespread assumption – a correct one, we believe – is that while competition will place a check on the rates companies can charge for the sale of power, the *delivery or distribution* of power will continue to be regulated. The creation of competitive conditions for the sale of power, however, is not the regulatory end game. To serve the public interest effectively, regulators must create conditions under which customers receive distribution services at the lowest reasonable rates. Traditional cost-plus regulation will not accomplish this.[7] Instead, as we discuss below, regulators should take active steps both to encourage the types of distribution competition that are feasible and to implement rate structures that will provide proper price signals about the costs of distribution alternatives.

What Types of Competition Can Exist in the Distribution of Power?

It remains a broadly held view that the distribution of power within a geographic confine is a natural monopoly and, at the same time, that the economies of scale in

[6] See *Alternatives to Traditional Cost-of-Service Ratemaking for Natural Gas Pipelines, Docket No. RM95-6-000, Regulation of Negotiated Transportation Services of Natural Gas Pipelines*, 74 FERC ¶ 61,076 (1996).

[7] *See, e.g.*, Robert M. Spann, Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis, 5 RAND J. OF ECON. 38-52 (1974); H. Averch & L.L. Johnson, *Behavior Of The Firm Under Regulatory Constraint*, 52 AMERICAN ECON. REV. 1053-1069 (1962).

distribution are exhausted with a relatively small-sized system.[8] These factors do not rule out competition. On the contrary, they facilitate it – at least in some forms. While few would argue that it is desirable to run duplicative distribution wires down a city street, the fact that the costs of distribution are not appreciably different between large and small utilities does create other competitive opportunities.

Franchise competition between public and private electric distribution utilities is one of them. Franchise competition is, in effect, the competition that can exist by virtue of the fact that an existing distribution system is vulnerable to displacement at the end of the franchise term. This competition typically takes two mirror-image forms. On the one hand, a municipally-owned utility may elect to sell its facilities to a neighboring private utility. Several years ago the City of Sebring, Florida and neighboring Glades Electric Cooperative sold their systems to Florida Power Corporation, for example.[9] Conversely, the municipality, exercising its powers of eminent domain, might elect to form a new utility, displacing the incumbent private utility. The City of Las Cruces, New Mexico and the City of Alma, Michigan, have elected to go this route, displacing El Paso

[8] It also bears note that, although private distribution systems, on average, are larger than their public counterparts, that size differential does not itself translate into a cost advantage. Discussing the point in 1964, the Federal Power Commission observed that "the physical nature of distribution systems permits many small distributors to operate their systems with a quality of service and of costs which are frequently comparable to those of larger power systems." National Power Survey (Federal Power Commission), Part I, at 28 (1964). "A major reason why relatively small distribution systems are economically feasible," it observed, "is that the cost of distribution is much more sensitive to the intensity of customer loads than it is to the size of the system." *Id.* *See also*, Leonard W. Weiss, *Antitrust in the Electric Power Industry*, *in* PROMOTING COMPETITION IN REGULATED MARKETS 145-46 (Almarin Phillips ed., 1975).

[9] See Florida Public Service Commission Order No. 18028 (1995); Florida Public Service Commission Order No. PSC-97-1272-FOF-EU (1997).

Electric Company and Consumers Power Company, respectively.[10] The Village of Lakewood, New York has made a similar election and other cities, like Dunedin, Florida are also actively considering municipalization.[11]

Yardstick competition is yet another form of competition in the distribution of power. The fact that more than one distributor can provide electric distribution services in a state, or in several neighboring states, allows the regulator to compare the performances of the utilities it regulates to one another as well as to other utilities when it sets rates. While these types of comparisons are sometimes difficult to make, they do provide a check on the reasonableness of the utility's performance, if only because it might fear the results of an unfavorable comparison.[12]

Last, while not providing a complete substitute for the existing monopoly distributor, distributed generation and conservation services can provide meaningful substitutes for distribution facilities where the distribution company is considering expansion of its plant to meet load growth and where the incremental cost of these

[10] City of Alma, 80 FERC ¶ 61,265 (1997); City of Las Cruces v. El Paso Electric Co., 80 FERC ¶ 61,160 (1997). An ALJ recently awarded El Paso stranded cost relief, but at a level greatly reduced from the utility's claim. City of Las Cruces v. El Paso Electric Co., 83 FERC ¶ 63,017 (1998).

[11] *See, e.g.*, http://www.ci.dunedin.fl.us/dunedin/elec-utl.htm; Village of Lakewood, N.Y., 85 FERC ¶ 61,008 (1998).

[12] A February 16, 1999 article in the Detroit News points up the value of this simple lesson in the cable industry. "We've been facing competition for over two years," the article quotes John McNeel, general manager of TCI's operations in southern Oakland County. "It has helped us focus on our customer service and also helped us focus on what we offer customers," the quote continues, "And even in areas where we don't have competition, we still have to answer to customers and to the local communities. They may not have rate regulation power, but that doesn't mean it can't come back." *Cable Bills Soar 10 Percent in Two Years*, DETROIT NEWS, Feb. 16, 1999 at A1. Tellingly, the article notes, rate increases have been smallest in service territories served by more than one cable operator and the rates of the Detroit area's lone municipally-owned cable system – run by the City of Wyandotte -- are the lowest of all the Detroit cable operators.

substitutes is less than the incremental cost of expansion. These types of competition, however, can be killed in their infancy unless state regulators adopt rate design and interconnection measures that protect their viability.

Promoting competition, of course, is not a goal in itself. Its purpose is to promote economic efficiency in order to advance consumer welfare. And when economists discuss economic efficiency, they are really talking about two related, but distinct concepts: allocative and dynamic efficiency.

Allocative efficiency is basically a static concept. It reflects the notion that there is a set of price signals that will result in the maximally efficient allocation of resources. It assumes, quite logically, that within a given time frame, if one good or service is priced too high it will consume resources that optimally would have been utilized elsewhere.[13] This is one of the classic objections to monopoly; it forces consumers to expend scarce resources on goods or services in amounts out of proportion to the goods or services of value to society.

Dynamic efficiency is a significantly different concept. Dynamic or x – efficiency, as it has been termed by economists,[14] is a measure of the impact that competition has on technological innovation. Its spurs the grocer not merely to monitor

[13] *See, e.g.*, MEYER, ET AL., THE ECONOMICS OF COMPETITION IN THE TELECOMMUNICATIONS INDUSTRY 76–77 (1980).
[14] *See, e.g.*, Harvey Leibenstein, *Allocative Efficiency Versus X-Efficiency*, 56 American Econ. Rev., 392-415 (1966).

its inventory, but to do it by computers; it is the force that moves farmers from hoes to tractors.

Although they cannot be neatly categorized, franchise and yardstick competition tend to promote dynamic efficiency, while pricing mechanisms typically are considered means to improve allocative [as well as dynamic] efficiency. Despite occasional tensions between the two concepts,[15] both can play critical roles in consumer protection. We discuss their complementary roles in improving the efficiency of electric distribution below.

Franchise Competition

In his recent book, Peter Fox-Penner notes that until the 1920's "the awarding of franchises, often for short periods or non-exclusively to promote competition, was *the* primary means of controlling the industry."[16] Although states later determined that franchise competition alone provided inadequate consumer protection,[17] it has remained

[15] The FERC, for example, has recognized peak load pricing - primarily through recovery of fixed costs in usage charges -- as the most desirable means of rationing scarce capacity. Its gas pipeline regulations, in fact, codify this concept. *See, e.g.*,18 CFR § 284.7 (b),(c). At the same time, however, it has also recognized in the past that including fixed costs in a usage charge may be needed to provide the regulated company an incentive to maximize sales. *See, e.g.*, Natural Gas Pipeline Co. of America, 25 FERC ¶ 61,176 at 61,482 (1983). FERC's current rate design policy -- the so-called "straight-fixed variable" (SFV) rate design -- underplays this concern and has been the focus of several recent comments by pipeline customers, consumer advocates and state regulators. *See, e.g.*, Comments of the Customer Coalition, FERC Docket No. RM98-10 (February 1, 1999); National Association of State Utility Consumer Advocate's comments on regulation of short-term natural gas transportation services etc under RM98-10 et al. (Jan. 21, 1999); Preliminary comments of Public Service Commission of State of New York re regulation of interstate Natural Gas Transportation Services under RM98-12 (Feb. 1, 1999).

[16] Peter Fox-Penner, *Electric Utility Restructuring: A Guide to the Competitive Era*, 1997 (PUBLIC UTIL. REP.) 95 (emphasis added).

[17] *See* Kahn, *supra* note 2, at 116-119.

as a competitive supplement to the rate regulatory systems that state governments later developed. Thus, most state constitutions still include various prohibitions against the granting of exclusive franchises to individuals or private corporations.[18] While states often restrict competition among private utilities within designated franchise areas, they do not usually preclude the localities in which the utilities operate from forming their own competing systems.[19] On the contrary, the presumption is that, in the absence of an agreement as to exclusivity, the mere grant of a franchise by a municipality to a public utility does not give the public utility a right to be free from competition by the municipality or a third party.[20] This is true even though, by entering into competition with the public utility, the municipality might thereby undermine the value of the utility's franchise.[21]

Municipalization, as the foregoing suggests, is not a new phenomenon. Examples go back well over a century.[22] Moreover, "[t]here has been a steady stream of franchise-related competition and litigation during at least the past 35 years."[23] More than twenty-five years ago, Alfred Kahn, characterized municipalization as an example of the "intense rivalry between public and private systems."[24]

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[18] *See* cases cited at 54A AM. JUR. 2d, Monopolies, Restraints of Trade, And Unfair Trade Practices § 829.
[19] *See* National Power Survey (Federal Power Commission), Part I, at 19 (1964).
[20] Tennessee Elec. Power Co. v. Tennessee Valley Auth., 306 U.S. 118 (1939); Puget Sound Power & Light Co. v. Seattle, 291 U.S. 619, 626 (1934) (utility assumed risks of competition "when it entered the field").
[21] *See* 36 AM. JUR. 2d Franchises § 35.
[22] NATIONAL POWER SURVEY (Federal Power Commission), Part I, at 23-25 (1964); David Penn, *Public Power's Vital, Procompetitive Role in the U.S. Electricity Industry's Future*, Remarks before the Annual Conference of Michigan State University's Institute of Public Utilities, Williamsburg, Va., Dec. 11, 1995, at 23-24; Bradley, supra 17 Energy L.J. at 67.
[23] Fox-Penner, *supra* note 13, at 95.
[24] Kahn, *supra* note 2, at 105.

"[T]here is strong evidence in the public utility arena," he wrote, "that competition between the two systems of organization, like competition among private businesses, is highly conducive to improved performance."[25]

Today, preserving franchise competition takes on perhaps even greater importance as virtually-disaggregated distributors no longer engage in (or face discipline from) competition in the sale of power. Judging from their initiatives of the last several years, it is clear enough that regulators and legislators in many states expect competition in the sale of power to yield considerable consumer benefits. Yet, as Dr. Fox-Penner also notes, "direct access [to power suppliers] itself does not guarantee that economic efficiency of power *distribution* will improve."[26] In fact, if we measure efficiency broadly in terms of service reliability and quality in relation to cost, two factors – cross-subsidy and mergers – tend to move distribution efficiency in the opposite direction.

As Professor Harry Trebing, former Director of Michigan State University's Institute of Public Utilities, has observed, if regulated utilities can shift resources into unregulated activities like power sales, "asymmetric deregulation will provide an incentive to fragment the network by transferring assets to nonregulated activities [and] will be an inducement to disinvest in the network whenever alternative profits appear to be higher."[27] "Any network

[25] *Id.* at 104.
[26] Fox-Penner, *supra* note 13, at 263 (emphasis added).
[27] HARRY M. TREBING, MARKET CONCENTRATION AND THE SUSTAINABILITY OF MARKET POWER IN PUBLIC UTILITY INDUSTRIES, Paper presented at the National Association of Regulatory Utility Commissioners (NARUC) annual meetings in Boston, Massachusetts, Nov. 11, 1997, at 7.

disinvestment," he added, "could result in both a denigration of infrastructure and quality of service."[28] As generation becomes unregulated and distribution, generation and transmission become functionally unbundled, private utilities with generating affiliates will have increasing incentives to shift resources to unregulated power sales and away from investment in the distribution network. Franchise competition can work to offset this tendency.

Similarly, the trend toward mega-mergers results in the elimination of separately-owned distribution systems that can provide regulators with benchmarks. It will become increasingly difficult for regulators to measure the quality and reliability of distribution systems as mergers leave them with fewer and fewer distributors to compare. Again, franchise competition can offset this tendency.[29]

These concerns are not trivial. Serious concerns about the quality and cost of distribution exist quite apart from the cost of power. The Chicago City Council for example, ordered a report from its Department of Environment on the franchise agreement between the City and Commonwealth Edison, a report prompted by "serious concerns about the reliability of Edison's electric distribution system."[30] The report recommended against

[28] *Id.*

[29] In commenting on a draft of this article, Dr. Fox-Penner makes the valid observation that improved measurement techniques make it possible for regulators to scrutinize distribution efficiency in ways that were not possible only a few years ago. He also argues that, with disaggregation distributors may face heightened scrutiny from regulators, as their distribution costs become the focus of regulation. See, e.g. Daniel O'Neil, T&D Reliability: The Next Battleground in Re-Regulation," Public Utilities Fortnightly 42 (March 1, 1999). These are positive developments, but without the complementary force of competition at work, the public will remain unnecessarily dependent on the existence of "good" regulation.

[30] Edison Franchise Five-Year Report, Report to the Committee on Energy, Environmental Protection and Public Utilities, Chicago City Council (July 29, 1996), at I.

takeover, noting that Edison was obligated by its franchise agreement to upgrade its facilities.[31] Cost is also a particular concern in rural areas. Distribution costs in portions of Vermont run as high as 12 cents per kWh, dwarfing the cost of power (3-5 cents).[32]

Despite the long history of the phenomenon, municipalities considering the formation of their own electric distribution system today face a new hurdle – FERC now permits the incumbent utility to claim that municipalization of its distribution assets strands the utility's generating costs. If the utility can demonstrate that it had a so-called "reasonable expectation" that it would continue to serve the municipality's residents – even after expiration of the franchise – the utility is entitled to collect a charge from the new municipal system equal to the difference between what it would have recovered from its former customers had it retained the distribution franchise and the presumably lower, competitive price it could obtain for its power in the open market.[33] Not surprisingly, the rate of municipalization in an industry that saw 75 municipalizations between 1960 and 1989 has trickled to a handful in the 1990s.[34]

If franchise competition is to retain its historical role as a supplement to rate regulation,

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[31] *Id.* at iii.

[32] August 4, 1998 conversation with Raymond Koliander, Chief of the Economic Division and Director of Rates and Tariffs for the Vermont Department of Public Service.

[33] *See, e.g.*, City of Alma, 80 FERC ¶ 61,265 (1997); City of Las Cruces v. El Paso Electric Co., 80 FERC ¶ 61,160 (1997).

[34] *See, e.g.*, Harvey L. Reiter, *Competition between Public and Private Distributors in a Restructured Power Industry*, 19 ENERGY L.J. 333, 341 n. 25 (1988) and authorities cited therein. In that article, the author discusses the fallacies in FERC's assumption that utilities, many of whom had decades-old obligations to wheel power, could have any expectation, much less a reasonable one, that they would be entitled to recoup lost power sale revenues from customers after their franchise agreements or wholesale contracts expired.

federal policies providing utilities the forum to make previously unheard of stranded cost claims need to be changed. When a franchise agreement has expired, the municipality must be free to form its own distribution system or to accept bids from third parties to take over the system's operation. The incumbent utility should be entitled to fair compensation for its *distribution* assets, but it should not be permitted to recover its above-market *power* costs from the utility replacing it.[35]

Yardstick Competition

Franchising procedures under which local, state or federal governments award franchises of finite duration to entities that will run local gas, electric and water distribution systems, have been employed successfully as a means of introducing a form of competition for the right to do business within the geographic area. In addition to the pressure that a fixed term franchise places on the incumbent to perform well and contain costs, having a multiplicity of distribution franchises to compare allows the regulator to employ comparisons of the performances of various franchisees as a form of "yardstick competition."[36]

[35] Proponents of stranded cost recovery make the assertion that when a municipality takes over operation of the incumbent utility's distribution system and purchases power from a third party using the utility's transmission network, it is abrogating a "regulatory compact" between the utility and the state. The authors and other commentators have questioned the validity of this argument, particularly as applied to *expired* franchise agreements and wholesale contracts. *See, e.g.,* Reiter, *supra* note 30, at 334-39 and references cited therein.

[36] Claude Crampes and Antonio Estache, *Regulating Water Concessions: Lessons from the Buenos Aires Concession*, *in* THE PRIVATE SECTOR IN INFRASTRUCTURE, (Public Policy for the Private Sector, World Bank, Sept. 1997). *See also* Leonard W. Weiss, *Antitrust in the Electric Power Industry*, *in* PROMOTING COMPETITION IN REGULATED MARKETS 146 (Almarin Phillips ed., 1975). Franchises ("concessions" in the

In 1971, looking to employ yardstick and franchise competition, Minneapolis decided to award two franchises for refuse collection for different parts of the city: one to the municipal sanitation division and a second to a private corporation:

> The city kept records on the performance of its own department and of the corporation. The analysis of these records . . . for the period 1971-75, showed that both the municipal sanitation division and the private firms improved their efficiency over the period: the number of tons collected per shift increased whereas the number of customers' complaints decreased. There seems to be no doubt that it is the increased competition which caused the productivity of refuse collectors to rise. Indeed, there was no change in the technology of refuse collection between 1971 and 1975; the same trucks were used throughout the period and the frequency of collection, the crew size and the location of disposal sites remained unchanged. Besides, it could be observed that, as the city department increased its productivity to match that of the private firms (it reduced the number of crews working each day and it emulated the private firms by implementing an incentives system according to which workers could leave the job after completing their routes), the corporation reacted by adding extra services at no extra cost and by agreeing to a 4 percent price reduction in 1975.[37]

Yardstick competition can and should play an important role in the regulator's review of a utility's rates. While the use of such yardstick comparisons in the regulatory process

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World Bank literature) can take a variety of forms. Ownership of the assets can remain in the hands of the operator (the typical U.S. utility model). Alternatively, the local government can retain asset ownership, but turn control of the assets over to the operator, giving the operator responsibility for facility replacements, expansions and improvements. Discussion with Bernard Tenenbaum, Deputy Director, Office of Economic Policy, Federal Energy Regulatory Commission (April 23, 1998). Even privately owned utilities have begun experiments with management of some distribution functions by outside contractors. For example, The Brooklyn Union Gas Company, a gas distribution utility, has entered into one year contract with Enron Capital and Trade Corp. to manage its contracts for gas supply and capacity held on interstate pipelines. Proposal by The Brooklyn Union Gas Company to Enter into An Asset Management Agreement with Enron Capital and Trade Resources Corp., Case No. 98-G-0239, "Notice Requesting Comments," New York Public Service Comm'n (Feb. 20, 1998).

[37] Kerf, Michel, "*The Impact of EC Law on Public Service Concessions -- a Legal and Economic Analysis*," World Competition, Vol. 18, No. 4 (June 1995), at 115. Kerf also recounts examples of effective yardstick competition being employed by Great Britain, France, Hungary and Argentina in the water and telecommunications industries. *Id.* at 114-17.

has been limited – in part because of the complexities of developing suitable comparisons of various integrated utilities – the existence of distribution-only companies should make such comparisons easier to undertake and, consequently, more valuable. In Norway, where 60 transmission and 200 distribution entities operate their own systems, regulators have taken affirmative steps to employ yardstick comparisons in setting rates. The Norwegian Resources and Energy Administration has devised software that it distributes to utilities so they can perform their own efficiency analyses. The results of these studies are then used as factors in setting the utilities' rates. According to Jan Moen, the agency's Director of Regulation and Demand Side Management, Norway is the only country of which he is aware to use such distribution efficiency analyses in setting rates.[38]

The Unlevel Playing Field of Distribution Plant Expansion and Alternatives

One of the most common methods employed by utilities to recoup the costs of system plant expansion is to roll the costs of such expansions into system wide rates. This methodology, widely embraced by regulators, is anchored in traditions of economic development and universal electric service. It rests on the notion, as FERC once put it, "that an integrated system is designed to achieve maximum efficiency and reliability at minimum cost on a system wide basis."[39] In an era where competitive alternatives to monopoly services have developed, however, indiscriminate application of rolled-in

[38] E-mail from Jan Moen, Director of Regulation and Demand Side Management - Norwegian Resources and Energy Administration , Feb. 19, 1999. The agency refers to its efficiency analyses as data envelopments analyses or DEAs. *See* http://webben.nve.no/regulation/publication.htm. Barbara Alexander, former Director of the Consumer Assistance Division of the Maine Public Utilities Commission, recommends that regulators place the burden on utilities to demonstrate why they cannot achieve the performance standards of comparable utilities or even "other industries" in the state or region. Alexander, supra at 50.

[39] Otter Tail Power Company, 12 FERC ¶ 61,169 at 61,420 (1980).

pricing may actually harm the consumers it is intended to protect by masking the true cost of utility expansions in relation to available alternatives.

The problem created by rolled-in pricing of electric distribution plant expansions is this: the costs of expanding distribution plant to serve new or increased electric load are hidden when they are spread among the utility's entire customer base. Consumers may forego consideration of other, truly cheaper alternatives because they only pay a fraction of the actual cost of the plant expansion. The result is a mis-allocation of scarce resources and a reduction in competition from alternative technologies.

The issue confronting regulators in devising electric rate structures has nearly identical parallels in the gas and telecommunications industries. There are a variety of local services offered to residential telecommunications subscribers, for example, like call waiting, call conferencing, caller identification services, etc.. Rolled – in pricing of these specialized services would mask the true costs of facilities needed to make them possible. Direct assignment, by contrast, would allow only those customers who want specialized services to pay the associated costs.

The importance of pricing specialized services separately was advocated in the early 1980s by several economists. Richard Gabel, for example, reasoned that facility costs would be the same only if the facilities would have been constructed for each of the

services supplied independently or in common.[40] The exchange plant used to provide basic services, he reasoned, was designed essentially for accommodating long distance toll service rather than local service.[41] Switching costs for direct distance dialing or transmission of digital data, he pointed out, were much higher than local switching costs for basic local voice service.[42] Thus, he concluded, "the exchange plant is much more costly than it would have been if it had been designed and built to supply local service alone, and economic cost – causation would result in allocating a greater share of exchange costs to toll usage."[43]

It bears noting that, in the telecommunications industry, as in the electric utility industry, facilities used to provide some services a customer wants may also be used to provide other services the customer does not want. That is because the plant expansion is likely to be integrated with the existing plant. Local telephone plant, for example, may not be physically segregable from facilities used to provide long distance, switching and data communications services. However, it is not an inherent requirement of direct assignment that the facilities costs to be assigned directly must be physically segregable from the rest of the utility's system.[44] Even under agency rules favoring rolled-in pricing, it has been held, for example, that integration of the expansion facilities is not sufficient; the proponent of rolled-in pricing must establish both that the expansion facilities are

[40] Richard Gabel, *Allocation of Telephone Exchange Plant Investment*, *in* ADJUSTING TO REGULATORY, PRICING AND MARKETS REALITIES, at 452 (1983).
[41] *Id.*
[42] *Id.* at 456.
[43] *Id.* at 455.
[44] *See* United Gas Pipeline Co., 8 FERC ¶ 61,051 (1979), *affirmed*, United Gas Pipeline Co. vs. FERC, 649 F.2d 1110, 1114 (DC Cir.1981).

integrated with the existing system *and* that the expansion benefits other system users.[45]

FERC's pricing policy governing pipeline expansion projects has been subject to similar criticisms. Commenters have argued that, by rolling in the costs of pipeline expansions, a pipeline with a depreciated rate base can underprice its competitors, even though its incremental cost of expansion may be higher than the incremental costs of its competitors. Testifying in a recent case, economist Jeffrey Makholm noted, for example, that the incremental cost of the pipeline's expansion facilities was five times the rolled-in rate it proposed to charge. This type of disparity, he pointed out, would discourage entry by more efficient competitors.[46]

To be sure, there are circumstances where rolled-in ratemaking can serve a valuable purpose. As Dr. John Wilson has observed, for example, there is a logic to the roll-in of some local exchange plant costs in the telecommunications industry. Local exchange plant is constructed to serve not merely the local subscriber but the entire system:

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[45] *See, e.g.*, Great Lakes Transmission, L.P., 75 FERC ¶ 61,089 at 61,279 (1996) (referring to "two-pronged" test).

[46] Direct Testimony of Dr. Jeffrey Makholm, Transcontinental Gas Pipe Line Corp., FERC Docket No. RP95-197. "Existing pipelines already have the *legitimate* competitive advantage," he said, "of being able to add capacity to existing pipe (i.e., the cost of adding compression and/or loopings frequently is less expensive than laying new pipe)." *Id.* Rolled-in rate treatment, on the other hand, extends the competitive advantage of an existing depreciated pipeline like Transco because it can attract new business even if its cost of adding new facilities is no lower than those of its competitors. Roll-in allows the pipeline to charge the new customer a rate less than the cost of the expansion by spreading the differential to its existing customers. *Id.* at 61.

> [C]ustomers want private loops not only for themselves so they could make and receive calls without blocking from neighbors, they also wanted others to have private loops as well so that their calls to others would be completed. Not only were usage considerations a cost – causing factor, this also illustrates that it is more accurate to view subscriber loop as part of the integrated network than as a customer – specific cost .[47]

Dr. Wilson was also careful to distinguish local exchange plant from customer specific service connections in the gas and electric utility businesses. The costs of these connections, he observed, may properly be borne by the individual customer or through fixed usage charges, since "no gas or electric service subscriber benefits directly from another subscriber's service connection."[48] By contrast, no telephone user "would want telephone service unless others had loops."[49]

Unlike telephone service, the distribution of electricity does not inevitably depend on the existence of a network. In fact, grid expansion can create an impediment to more efficient methods of delivering electricity service. For example, distributed generation (small scale generation sited on the distribution system or customer premises) virtually eliminates line losses. This provides an efficiency advantage over central station generation that does not get reflected in relative prices when the costs of grid expansions are rolled into system rates.

The focus of regulators should not be to maintain the network simply because it

[47] John Wilson, *Telephone Access Costs and Rates*, PUBLIC UTIL. FORTNIGHTLY, Sept. 15, 1983, at 24 n.7.
[48] *Id.* at 19.
[49] *Id.*

has always been the method of delivering electricity and in the mistaken belief that it is required for universal service. Instead, regulators should employ regulatory policy to achieve the maximum utilization of the existing grid that best accommodates competitive resources resulting in the lowest cost of service. Moving in this direction, however, will require regulators to buck long-standing regulatory practices that stress simplicity in determination and standardization of rates for all in a class.[50]

Historically, the distribution function was a simple one geared singularly to reliability. Just size the distribution conductors to meet the electrical load plus plenty of room to meet peak capacity demands and roll the cost into the rate base. The greater the expense, the higher the return on the investment. For years this approach worked tolerably well, as technology provided few alternatives. But, in much the same manner as technology drove fundamental changes in generation that led to competition, today's technologies can improve distribution services.

While the principle of providing the same terms and rates for an entire class of customers is based on noble anti-discrimination principles, these worthwhile doctrines cannot be used as a rampart against proper price signals that encourage greater efficiency and utilization of the distribution system.[51] There are methods, as we discuss, to allow those efficiencies to take place without destroying anti-discrimination principles.

[50] *See, e.g.*, Re Idaho Power Co., 25 PUR 4th 91, 101 (1978) and Re Consolidated Edison Co. of New York, 8 PUR 4th 475, 491 (1975).

[51] Statutory bars against undue discrimination are common features of state and federal regulatory regimes. For a good discussion of how these statutory prohibitions led to the development of standardized rate classes, see A.J.G. PRIEST, PRINCIPLES OF PUBLIC UTILITY REGULATION 285-326 (1969).

The historic "one size fits all" rate for small customers encourages consumption patterns that require continued distribution capacity expansion despite the significant costs that may be incurred. Because the customer is not economically responsible for the costs of their individual energy choices, customers choose their own least capital cost options, even if the resulting distribution cost impact is greater in the aggregate.

The implications of the historical policy, and the advantage of an alternative policy is best understood with an example:

Suppose the full cost to upgrade the distribution grid to serve a hospital's new wing with a 200 kilowatt additional load is $300,000. Meanwhile, the hospital considers distributed generation in the form of a 200 kW fuel cell[52] at a capital cost of $400,000. If the total combined price for energy from the grid (distribution, transmission plus generation) was 5.5 cents per kWh, while the fuel cell total operational cost minus capital investment was 3.3 cents per kWh, the smart customer or supplier might seriously consider the fuel cell as an option. This is so only if the incremental capital cost differential is $100,000. Under that assumption the hospital has a potential payback of less than 4 years.[53] If, however, the cost to the hospital for the distribution upgrade is

[52] A fuel cell generates electricity through ~~and~~ an electro-chemical process using hydrogen as a fuel. The hydrogen is in turn derived from a hydrocarbon source such as natural gas or methanol through a device called a reformer. Fuel cells are small and produce little noise or air pollution, so they can be sited at the load they are to serve.

[53] This assumes a discount rate of 10%, a capacity factor of 95%, and replacement power generation at less than 10 cents/kWh. It is important to note that the fuel cell industry has ambitious targets to reduce the cost of fuel cells from their present 2-3 $/watt to $0.05 $/watt by 2010. At $1/watt a fuel cell can generate electricity at a cost of less than 4 cents per kWh and could threaten to make the distribution system

zero, (because it is paid by the distribution utility then rolled into rates for all distribution customers), the customer will never see a payback on the fuel cell alternative.

Even though the most efficient option for society is the fuel cell, it will never be selected as long as distribution costs are spread over a vast number of captive customers. All customers will bear the cost of inefficient decision making, but can take solace that they all bear it equally.

Customer sited or distributed generation currently faces not only the difficulty of competing with distribution upgrades paid by all customers, but also tacked on stranded cost or exit fees. Although some jurisdictions have taken the step of limiting certain stranded cost payments for customer sited generation[54], there is little action on levelizing the field for all forms of distributed generation. In fact some utilities are challenging the limited incentives available for renewable distributed generation.[55]

Rolled-in rates in a monopoly structure ensure that conservation measures, fuel switching, load control, energy storage options, and distributed generation are

obsolete. *See* Hoogers and Potter, "Fuel Cells -- the Ultimate Clean Source of Power?", RENEWABLE ENERGY WORLD, Jan. 1999, at 51-57.

[54]A. Res. 16, §28(b), 208th Leg., 1999 New Jersey Leg. *See also* S. Bill 300 §7-513(3), 413th Leg., 1999 Md. Gen. Assem.

[55]MidAmerican Energy Company, FERC Docket No. EL99-3-000. The utility, MidAmerican, opposes the net metering ruling of the Iowa Utilities Board requiring the utility to accept energy from renewable resources by spinning the meter in reverse. Net metering provides the customer-generator with credits at the same rate as the utility charges for energy. The crux of the utility's complaint is that avoided generation is less valuable than the retail rate but the argument misconstrues the nature and value of generation sited on the distribution system versus central plant generation. As argued herein, certain distributed generation may be even more valuable than the retail rate.

underutilized. As long as costs for these alternatives are born completely by the customer, while the costs to provide the equivalent service from distribution enhancements is a shared rate-based cost, uneconomical distribution upgrades will continue to displace more economical forms of providing equivalent energy service.[56] Furthermore the current system, by keeping out these technologies, retards future advancements in fuel cells, photovoltaics, and other small scale renewable technologies that could have the significant ancillary benefit of improved air quality[57].

What would be useful is a distribution charge structure that has differential cost based on: full load capacity, demand, and time of energy consumption. There should be some difference reflecting the higher cost of serving a residential customer with the potential to put 80 kilowatts of demand on the distribution system (typical 400 ampere new service) versus a 13 kilowatt customer (older 60 ampere service), particularly if both customers have an average demand of just one kilowatt (the average for a typical residential customer using 720 kWh per month). The methodology used by many regulatory commissions to determine the cost of distribution treats both of these customers, and all customers for that matter, as if they were identical, despite the

[56]The Connecticut Department of Public Utility Control determined in a Connecticut Light and Power rate case that the minimum system cost analysis (the minimum distribution system needed for a utility to stand ready to serve a customer at no load) justified a single customer charge for distribution customers. ~~but ironically~~ The Authority followed that analysis with a discussion of the appropriateness of directly assigning conservation program costs. Connecticut Light and Power, 124 PUR 4th, 532, 574-575 (1991). This disparate regulatory treatment is an ironic reflection of reality, where customer initiated conservation and load management costs are born directly by the customer while distribution costs are averaged. Fairer treatment would have been to roll the utility's conservation costs into average rates, just like distribution costs, or directly assign both.

[57]US Department of Energy, Energy Information Administration, Annual Energy Outlook 1999, (Dec. 8, 1998). *See* www.eia.doe.gov/neic/press/press114.html

difference in facilities needed to serve each.[58]

One means of reform is to require distribution companies to make a payment or provide credit to those who avoid distribution costs. In the same vein as the PURPA requirement for purchasing generation at avoided cost, distribution companies could be required to solicit offers to reduce the load or demand on overloaded feeders. The greater the need for distribution capacity and concomitant cost, the greater the avoided cost payment.[59]

Savvy competitive suppliers will be able to leverage those avoided cost credits with a bundled supply package to offer customers on the overloaded area of the distribution system the best deal. Customers might only see an end use alternative that effectively lowers or eliminates their anticipated distribution upgrade cost and attendant rate increase.

[58]While the Illinois Commerce Commission accepted a general allocation of distribution costs to all customers it did note that a very small distribution system is all that is needed for all customers and only this component should be reflected in the fixed customer charge. The remainder of the distribution system was allocated on the basis of demand. Re Illinois Power Company, 117 PUR 4th 418, 423 (1990). Unfortunately, even this proper demand related cost allocation is lost in rate design when the price to all customers becomes a single flat per kilowatt hour rate that does not reflect the demand related nature of the distribution system nor does it signal the residential customer that higher demands are more costly to serve.

[59] When FERC first adopted regulations to implement the Public Utility Regulatory Policies Act (PURPA) it adopted a full avoided cost" rule obligating utilities to purchase the output of cogenerators and other "qualifying facilities" (QFS) at the utility's full avoided cost. State commissions, in turn fixed "administratively determined" avoided cost rates that utilities were obligated to pay for QF output. See "Cogeneration; Small Power Productions – Notice of Public Conference and Request for Comments," 64 FERC ¶ 61,364 (1993). Most industry observers know, in hindsight, that this approach led to sizable overpayments for electric capacity. But, in the ensuing years, most state commissions, with FERC's encouragement, shifted to the use of bidding systems to establish avoided costs. Id. at 63,491. The authors would likewise encourage state commissions to use bidding mechanisms rather than try to establish the avoided costs of distribution upgrades administratively.

Necessarily, the avoided cost payments would reflect the actual costs in a particular distribution area. Those connected to a fully loaded distribution line would receive greater discounts reflective of the higher avoided cost. Alternatively those customers in areas with excess distribution capacity may add load without additional cost until, of course, their line reaches capacity.

A different approach would be to provide a performance-based ratemaking that allowed a distribution company to utilize all alternative forms of supplying energy needs including supplying customers without connecting them to the grid. The performance-based structure would have to encourage the utilization of technology that lowered the overall cost of electric service, not just the cost of the distribution function. Such an incentive would encourage the use of conservation, load control and distributed generation where those alternatives were less costly than changing the distribution system. These technologies would receive the same treatment as distribution upgrades and cost recovery, be it rolled into rate base or otherwise, would be the same. The existing rolled-in rates advantage of distribution expansion would disappear.[60]

To maximize economic efficiency under this comprehensive performance based approach, distribution companies would have to be able to combine or offer their alternatives as a package with competitive suppliers. In that way, the load control or

[60] While marginal cost pricing for distribution is an attempt to address this issue in part, it continues to allow all expansion to be generally rolled into rates without identification of particular customer related costs. For a discussion on marginal distribution pricing and limited direct assignment of costs to a customer, see L.S. GOODMAN, THE PROCESS OF RATEMAKING, 403-404 (1998).

distributed generation could see maximum utilization through use by the competitive supplier for their needs when the load control or distributed generation was not needed to address the distribution function.

This approach is replete with opportunities for self dealing and, as Professor Trebing might note, would require vigilant oversight by a regulator. Divestiture of generation and/or strong affiliate transaction rules would ensure the distribution utility had no financial incentive to game the performance based approach.

Some Final Words

More than ever, regulators have been willing to reevaluate their approaches to protection of consumers from the market power of traditionally-regulated utilities. This open-mindedness can pay substantial dividends if it is applied to reform regulation of electric distribution services. An integrated approach to the regulation of electric distribution requires the regulator to look at how it can (1) facilitate franchise competition as a supplement to regulation, (2) employ yardstick comparisons to set rates and (3) reform rate structures so that distribution rates do not discourage the substitution of economically efficient alternatives for expansion of existing distribution systems. We make the following simple, but, we believe, important suggestions:

Franchise Competition. At the federal level, FERC should reform its stranded cost policies so that they do not place unreasonable hurdles to a municipality's ability to

replace the incumbent distributor when its franchise ends. States, for their part, should require local governments to consider the award of franchises on a competitive basis. Future franchise agreements, moreover, could be structured so that the terms under which the facilities would be turned back to the local government after franchise expiration are known and fixed in advance. This would open up the possibility, not only that the incumbent could be replaced by the municipality if it had performed poorly (or a competitor could perform better), but that it could be replaced by another private operator, perhaps a neighboring utility or one more distant.

Yardstick Comparisons. Regulators have made too little use of this regulatory tool. With the separation of generating and distribution costs that comes with divestiture, it should be easier for regulators to make meaningful comparisons. Regulators should also be willing to take a harder look at the experiences of regulators in other countries with yardstick comparisons. These types of comparisons, moreover, may become increasingly important in fashioning performance-based rate structures -- freeing the regulators from relying on benchmarks that compare the utility with itself.

Rate Design Reform. Last, regulators need to reexamine presumptions about the reasonableness of rolling the costs of distribution expansions into systemwide rates. Incremental pricing of distribution system upgrades and the use of competitive bidding mechanisms to determine the avoided cost of distribution upgrades will facilitate comparisons on the merits of alternatives to expanding distribution plant, like

conservation technologies and various forms of distributed generation.

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