



# Are electric utilities aboard the ‘train to Ithaca’?

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## ABSTRACT

Increasing competition for electric utilities, including distributed generation in the form of renewables, such as wind and solar has given rise to a paradigm shift in the industry that poses complex questions. How should the carrier-of-last resort obligation be administered? What form of price restructuring is required? The telecommunications industry traversed a similar path. The lessons from that experience suggest that regulation changes markedly slower than technology. This inertia poses a considerable risk for the utilities.

## 1. Introduction

In a pioneering article published more than 50 years ago,<sup>1</sup> the renowned economist and regulator, Alfred Kahn, foreshadowed a pricing problem that now dogs the electric utilities: that of the (uncompensated) carrier-of-last-resort (COLR) obligation.<sup>2,3</sup> Kahn cites as an example of this phenomenon a railroad running from Ithaca, N.Y., to New York City that served as the only means of transportation during inclement weather. The railroad terminated operations because usage-sensitive (volumetric) pricing failed to generate revenues sufficient to cover its predominantly non-usage-sensitive costs. Kahn maintained that prospective train passengers like himself would have been willing to pay to retain the option of using this form of transportation independent of their actual use because the availability of the train was a source of option value for them.<sup>4</sup> Under strict usage-sensitive pricing, however, there was no means for extracting such payments.

This example constitutes both a market failure and a business failure. It is a market failure because it would be inefficient for the railroad to cease operations if the value of the service it provides exceeds the costs incurred in providing it. It is a business failure because the railroad failed to adopt a pricing structure that was sustainable (in the sense of providing for its financial viability) under increasingly

competitive market conditions.

The parallels between Kahn's train of yesteryear and the electric utilities of today are immediate. First, in the absence of competitive alternatives, relying upon usage-sensitive prices to recover fixed (and sunk) costs harbors efficiency consequences, but would not necessarily undermine the financial viability of the enterprise. Second, under usage-sensitive pricing, the standby users of the system are not paying the “full freight” for the option-sensitive costs that they cause. Not only is this pricing structure inefficient, prices are not aligned with the economically relevant measure of costs, but it is socially inequitable as well because it results in subsidies flowing from regular users (those that do not partake of competitive alternatives) to standby users of the electric utility. Third, competition will ultimately drive efficient price levels and structures. Efficiency requires that usage-sensitive prices reflect usage-sensitive costs and option-sensitive prices reflect option-sensitive costs. This is a manifestation of the well-known *cost-causation principle*.<sup>5</sup>

The paramount problem and one that manifested itself in the telecommunications industry is that the market will demand changes in pricing and common carrier obligations at a markedly faster rate than regulators are prepared to implement them. This regulatory inertia is a source of considerable risk for electric utilities going forward.

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<sup>1</sup> Alfred E. Kahn, The Tyranny of Small Decisions: Market Failures, Imperfections and the Limits of Economics, *Kyklos*, Volume XIX, January 1966 at 23–47.

<sup>2</sup> For a comprehensive history and analysis of the duty to serve in telecommunications, see Michael H. Ryan, Telecommunications Carriers and the ‘Duty to Serve’, *McGill Law Journal*, Volume 57(3), 2012 at 519–551. For a similar treatment in the context of the restructuring of electricity markets, see Jim Rossi, The Common Law ‘Duty to Serve’ and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring, *Vanderbilt Law Review*, Volume 51, 1998 at 1233–1321.

<sup>3</sup> For a discussion of the institutional foundations of this problem and possible solutions in the telecommunications industry, see Dennis L. Weisman, Default Capacity Tariffs: Smoothing the Transitional Regulatory Asymmetries in The Telecommunications Market, *Yale Journal on Regulation*, Volume 5(1), Winter 1988 at 149–178.

<sup>4</sup> There is an extensive economics literature on the topic of option value. See, for example, Burton A. Weisbrod, Collective Consumption Services of Individual-Consumption Goods, *Quarterly Journal of Economics*, LXXXVIII, August, 1964 at 471–477. For a review of this literature and an application to telecommunications markets, see Donald J. Kridel, Dale E. Lehman and Dennis L. Weisman, Option Value, Telecommunications Demand and Policy, *Information Economics and Policy*, Volume 5, 1993 at 125–144. A frequently cited example of option value is that of national parks. Individuals would be willing to pay for the preservation of national parks independent of their actual use to retain the option of visiting such parks in the future.

<sup>5</sup> See Alfred E. Kahn, The Economics of Regulation, Vol I. Cambridge MA: The MIT Press, 1988 (First Published in 1970), Chapter 3; and James C. Bonbright, Principles of Public Utility Rates, New York: Columbia University Press, 1961, chapter IV.

## 2. Drawing the parallels: electric power and telecommunications

The electric utility industry is undergoing a competitive and technological paradigmatic shift not unlike that which transformed the telecommunications industry. Specifically, technological change coupled with market-opening provisions provide consumers with competitive alternatives to the traditional services provided by the utility. These include various forms of distributed generation using wind and solar energy, often referred to as renewables.<sup>6</sup> These competitive alternatives promise consumers considerable benefits, but they also raise complex issues attendant to the transition from a regulated monopoly to a competitive market structure.

Wind and solar offer the prospect of dramatically reducing the incremental cost per kilowatt-hour, but only when the wind and sun are favorable. During all other times, consumers who directly connect to alternative providers (or partake of self-generation) must default to the service supplied by the electric utility.

If renewables worked constantly that would not, at first blush, look like a problem for anyone except people generating expensive electricity. But renewables are intermittent, which means that in systems where the infrastructure was designed before intermittency became an issue—almost all of them, in practice—fossil-fuel, hydro-electric and nuclear plants are needed more or less as much as ever at times when the sun doesn't shine and the winds don't blow. And if such plants are shut out of the market by low-cost renewables, they will not be available when needed.<sup>7</sup>

This scenario is reminiscent of the advent of microwave technology that enabled MCI to enter the long-distance market in competition with the incumbent AT & T in the 1970s. AT & T continued to shoulder the COLR obligation because competitor-provided microwave facilities did not provide the same reliability as AT & T's network. Prof. Kahn identified a problem eerily similar to that now presented by renewables.

It is this problem that is the most troublesome aspect of the *MCI* case and others like it. If such ventures are economically feasible only on the assumption that when they break down or become congested subscribers may shift over to the Bell System for the duration of the emergency, they are indeed supplying an only partial service. If the common carrier is obliged to stand ready to serve and must carry the burden of excess capacity required to meet that obligation, it would seem that its average total costs would necessarily be higher than those of a private shipper or cream-skimming competitor who has no such obligation: the latter can construct capacity merely sufficient for operation at 100 percent load factors, with the expectation that it or its customers can turn to common carriers in case of need.<sup>8</sup>

An important question concerns the degree to which the use of competing electricity providers or self-generation is artificially stimulated by the COLR obligation imposed asymmetrically on the traditional electric utilities.<sup>9</sup> What is more, the COLR obligation creates something akin to a *rate death-spiral* in which the costs of standing by as a COLR are borne disproportionately by the traditional customers of the electric

utilities. As the predominantly fixed costs are spread over fewer and fewer customers, rates rise which further stimulates demand for alternative sources of electric power.<sup>10</sup> Hence, to some unknown degree the adoption of renewables is artificially stimulated by the "safety net" that the electric utilities provide as carriers of last resort.

The problems attendant to asymmetric regulation amidst increasing competition, which encompasses COLR obligations, cross-subsidies, and broadly averaged rates, did not go unnoticed by the incumbent AT & T. In a landmark speech delivered before the National Association of Regulatory Utility Commissioners (NARUC), John de Butts, then chairman of AT & T, sounded an alarm that proved to be quite prophetic.

On the other hand, it appears worth noting that the fervor for competition on the part of some regulatory officials has not been accompanied by any demonstration of enthusiasm for its necessary concomitant—deregulation. Which brings us to the question: can there be competition: real competition—when not all the parties to it enjoy the same freedoms or bear the same responsibilities, endure the same constraints.<sup>11</sup>

Mr. de Butts' speech fell largely on deaf ears, but that did not undermine the validity of the concerns that he raised that day in Seattle. It is probably safe to say that no regulator in attendance that day ever really thought that the competitive upstarts that were then nipping at the heels of AT & T would ever threaten the great behemoth's survival—but they would be wrong.<sup>12</sup> AT & T, once the largest corporation in the world, survived barely three decades after the de Butts speech (and only two decades after the court-ordered divestiture).<sup>13</sup> Today it exists essentially in name only after being acquired by SBC.

The Harvard business historian, Thomas McCraw, contends that "Almost all businesses, no matter how strong they seem to be at a given moment, ultimately fail — and almost always because they failed to innovate. Competitors are relentlessly striving to overtake the leader, no matter how big the lead. Responsible businesspeople know that they ignore this lesson at their peril."<sup>14</sup> The old AT & T was never quite able to "turn the corner" and transform its prowess in managing the regulatory process into successfully navigating the challenges of a competitive telecommunication market. The centripetal thought processes required of the former can work at cross purposes with the centrifugal ("think outside the box") thought processes that are the *sine qua non* for the latter.<sup>15</sup> As John Maynard Keynes famously observed, "The difficulty lies, not in the new ideas, but in escaping from the old ones. ..."<sup>16</sup>

<sup>10</sup> This problem may have been masked to a certain degree in the telecommunications industry by Moore's Law. Moore's Law roughly states that the cost of a given amount of computing power halves every 18 months. Jonathan Nuechterlein and Philip Weiser, *Digital Crossroads*. Cambridge MA: The MIT Press, Second Edition, 2013 at 149. In contrast, there is evidence of a trend toward markedly lower productivity growth rates in the electric power industry. See, for example, Jeff Makhholm, Agustín Ros, and Meredith Case, Total Factor Productivity and Performance-Based Ratemaking for Electricity and Gas Distribution, Presented at the 31st Annual Eastern Conference of the Center for Research in Regulated Industries, May 2012. Also, since the mid-1990s, electricity consumption has increased more slowly than output has expanded in the U.S., reversing a long-standing trend. Richard Hirsh and Jonathan Coomey, Electricity Consumption and Economic Growth: A New Relationship with Significant Consequences? *The Electricity Journal*, Volume 28(9), November 2015 at 72–84. This decreased growth in output is a contributing factor to the reduced productivity growth.

<sup>11</sup> John D. deButts, An Unusual Obligation. Speech Before the National Association of Regulatory Utility Commissioners, Seattle, Washington, September 20, 1973.

<sup>12</sup> See Dennis L. Weisman and Glen O. Robinson, Lessons for Modern Regulators from Hippocrates, Schumpeter and Kahn, in *New Directions in Communications Policy*, ed. by Randolph J. May, Durham NC: Carolina Academic Press, 2009 at 3–37.

<sup>13</sup> To be fair, AT & T's demise was not entirely of its own making. Antitrust officials and regulators, both state and federal, are properly characterized as unindicted co-conspirators. *Id.* at 11 and note 25.

<sup>14</sup> Thomas K. McCraw, *Prophet of Innovation*, Cambridge MA: Harvard University Press, 2007 at 495–6.

<sup>15</sup> Weisman and Robinson, *Op. Cit.* at 9–11.

<sup>16</sup> John Maynard Keynes, *The General Theory of Employment, Interest, and Money*,

<sup>6</sup> See Renewable Energy: A World Turned Upside Down, *The Economist*, February 25, 2017. <http://www.economist.com/news/briefing/21717365-wind-and-solar-energy-are-disrupting-century-old-model-providing-electricity-what-will> (Hereafter, *The Economist* article.).

<sup>7</sup> *Id.*

<sup>8</sup> Alfred E. Kahn, *The Economics of Regulation*, Vol II. Cambridge MA: The MIT Press, 1988 (First Published in 1971), at 238 (footnote omitted).

<sup>9</sup> There can be no real question as to the market value of a carrier of last resort for customers and competitors alike. The telecommunications industry is rife with examples wherein competitors intervened in regulatory proceedings to ensure that the incumbent providers were not relieved of their COLR obligation. In certain cases, competitors indicated that customers were unwilling to subscribe to their services unless the incumbent provider continued to serve as the carrier of last resort. See, for example, Weisman, 1988 *Op. Cit.* at 174–177.

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