Electricity Savings—Where's the Beef?

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Why are we doing this? Why are we upending a $250 billion a year business that provided a reliable electric supply for over a century? Why do we wish to confuse 122 million customers who still can't figure out why it costs more to fly from New York to Akron than New York to Paris? Why have we deprived millions of retirees of their dividends and caused billions of dollars of write-offs?

Is all of this just a full employment act for energy lawyers, consultants and lobbyists?

"Ah," you say, "we are doing it for the benefit of consumers, who will pay less for electricity." Really? When? And how much less? Politicians have misrepresented price savings by touting the percentage reduction of only part of bill. They have produced immediate price reductions by shifting the amortization of stranded costs from current to future years. They have proposed to reduce taxes levied on electricity sales, which presumably have to be made up for somewhere else. One regulatory agency decreed a double digit rate reduction for the industrial customers of a utility that had no industrial customers and a low single digit decrease for everyone else.

As for the power of choice, retail sellers of electricity have been dropping out of the market all over the place. They can't figure out how to make a buck, given the way the rules have been set up.

I received two mailings from potential suppliers. One came from a local oil distributor, and I wasn't sure of its credentials in the electric

and gas market. The other came from the marketing affiliate of a telecom mogul, and it included as a side benefit, a discount at the chain of bars owned by another affiliate. Now that the state proposes to put a tax on electricity delivery, I'm not sure that I'll save enough money, every month, to buy a sandwich in one of those bars.

So, to quote the little old lady in the wonderful Wendy's hamburger ad of the 1980s, "Where's the beef?" Why are we doing this?

WE AREN'T

We aren't. When you read the political proclamations, the regulatory rhetoric, and the way that utility executives blame the government when they make unpopular business decisions, you might conclude that utility restructuring results from a public policy decision. It doesn't. The demise of one technology and the rise of another destroyed the rationale for the old utility structure. Customers then clamored for the benefits that lower-cost suppliers could provide. Finally, public policy followed.[1]

So let's set the record straight. From the beginning of the industry to about 1960, electric generation exhibited increasing economies of scale. The bigger the generator, the cheaper the electricity that it produced. That characteristic provided the rationale for the regulated natural monopoly. One big generator serving all consumers in the area could sell at a lower price than many smaller generators each serving a fraction of the market.

All consumers, then, benefited from the elimination of competition. The state would keep out competitors, in order to allow the single generator to reach maximum output and lowest cost. Then the state would regulate the price charged by the generator, in order to make sure that the public—and not the monopolist—profited from the low costs. That's the story. That's an entire semester course on public regulation of business in one paragraph.

So what happened in 1960? The big, steam generating stations reached the efficiency limits inherent in the Rankine Cycle. You could make them bigger. You couldn't make them more efficient. At the same time, a utility installed the first gas turbine, a stationary jet engine—then a flimsy, tiny device, okay for peaking purposes, but no more impressive than the first Toyotas sold in this country. Manufacturers of power equipment, however, perfected the gas turbine, improving its reliability,

lowering costs, raising its efficiency to the point that, by 1990, the new smaller machines operated at efficiency levels higher than the conventional utility fossil-fired power stations.[2]

Utilities, however, moved in another direction to produce cheap energy: they went nuclear. Engineers who liked size embraced the ultimate in size. They failed, for the most part, to master the difficulties of nuclear power.[3] Nuclear projects raised costs. Since the utilities persisted in completing nukes in a period of slowing demand, they created the worst possible position for themselves: suppliers of a product with high fixed and low marginal cost in a market characterized by excess capacity.

The electric utilities, in other words, chose the wrong technology, while the upstart generators created by the Public Utility Regulatory Policies Act of 1978, who installed small generators, initially, favored gas turbines. To be fair, the Powerplant and Fuel Use Act, in place from 1978 to 1987, put limitations on utility's consumption of natural gas to produce electricity, but I think it's safe to say that the utilities did not like small units, and they really believed that we would run out of gas.

Now, let's see what happened to prices. From 1982, the year the Supreme Court passed on the legality of PURPA, to 1992, when Congress passed the Energy Policy Act, which opened the door to real competition in the electricity market, the price of all fuels fell 20%. We know, too, that the costs of new-type generators fell. But the price of electricity to both industrial and residential customers rose by over 25% (Table 1). It rose in a period of excess capacity, when utilities were installing units with low marginal costs, and independent power producers were demonstrating the increasing efficiency of the gas turbine. What would you do if you were a large purchaser of electricity, with your own output facing more and more competition in the global market? You would scream bloody murder:

> "Those regulators are keeping prices up! They are preventing us from buying lower-cost electricity from people who have the ability to produce it. The big utility generators no longer produce the low cost product. Why do we have to continue to buy from them?"

Congress responded, sort of, with the Energy Policy Act of 1992. It created a new class of wholesale electricity generator, and it decreed that

Table 1. Energy Prices
(1982 = 100)

	Producer Price Indices					*CPI*
	Fuels	Coal	Gas	Electricity	Petroleum	Electric
1982	100	100	100	100	100	100
1992	80	95	76	126	58	130
1998	75	93	77	130	36	133

Source: U.S. Department of Labor, Bureau of Labor Statistics.

owners of transmission lines could not keep competitors from using those lines, but it stayed away from giving consumers a right to choose electricity suppliers. From 1992 to 1998, despite the continued fall in overall energy prices and the installation of more low-cost generators, electricity prices continued to rise, although more slowly than before. Finally, California regulators, faced with inordinately high electricity prices—determined largely by past regulatory policies—launched an inquiry into an industry restructuring that contemplated customer choice.[4] Other states followed.

To recapitulate, the technology of generation changed in a way that removed the rationale for the utility's monopoly, enabled competitors to undercut the utility, and encouraged customers to demand the lower prices that new suppliers could offer. As Richard E. Balzhiser, former president of the Electric Power Research Institute, said:

> *...these technological developments—not laws and regulations—have introduced competition into the electric utility industry. Regulation is simply trying to keep up.*[5]

But don't get the idea that consumers will see those benefits, soon. The electric companies want to recover the costs supposedly stranded by the switch from regulation to competition. The suppliers of uneconomic services to utilities want to recover their costs. Backers of various social and environmental programs want to continue those programs at the expense of electric consumers as a whole. They all gathered, like vultures, ready to consume all the savings that I, innocently, thought that consumers would reap.

Mitchell Diamond, a Cornell alumnus, however, convincingly argued that the potential savings from deregulation were so great that we should view stranded cost payments as the price we should pay to cross into the promised land.[6] Keep in mind that implementation is the hardest part of public policy. If you have to pay off everyone to get them out of the way, you do so. But the payoff will be big enough to keep prices up for years, and it requires restrictions on consumers and on competitors in order to assure that the payment takes place.

In other words, we have to maintain the monopoly in order to achieve competition. Sort of like the withering of the dictatorship of the proletariat, maybe? Be patient.

WHY DO IT?

Ask any politician or industrial customer why he (usually) backs a restructuring of the electricity industry. Answer: to bring down prices. That certainly happened after the deregulation of other industries.[7] Under the pressure of competition, firms squeeze out unnecessary costs. They run more efficiently.

Wait a minute! Under the old regulatory system, didn't the regulator serve as a proxy for the market, setting prices that caused the utility to run efficiently and make no more than a fair return on investment? Why should the utilities operate more efficiency in a competitive market? I immediately headed for those economics texts that my wife had not disposed of in order to make room for cook books.

James C. Bonbright devotes a few pages in a long book on regulation to competition and efficiency. He defines two roles for price in an unregulated market:

> In the first place, the rate of output of any commodity will so adjust itself to the demand that the market price will tend to come into accord with production costs. But in the second place, competition will impel rival producers to strive to reduce their own production costs in order to maximize profits...[8]

Bonbright then declares that utility regulation brings prices and costs together, but then he asks "Where is the efficiency-incentive counterpart?"[9] and he concludes that regulatory incentives "are very ineffective in comparison with the stimulation of direct and active com-

petition."[10]

Clair Wilcox does not beat around the bush either:

> ...no effort is made to effect adjustments...so as to afford an incentive to efficiency... The hand of regulation has been lax. Operating expenses have not been tightly controlled... Facilities have been overpriced... Judging by the standards of the competitive market, regulation has fallen short. Competition...affords a sterner discipline.[11]

Well, I turned to my trusty copies of Prof. Kahn's two-volume text on regulation, opened the appendix, and I couldn't find any reference to efficiency. Not good. But, opening the book at random, I find this admonition to regulators:

> ...there has to be some means of...identifying the companies that have been unusually enterprising or efficient and offering...higher profits to them while denying them to others.[12]

The next sentence then referred me to Volume 2, Chapter 2, entitled "Incentives and Distortions," which is followed by Chapter 3, "Positive Influences on Public Utility Performance," which are discussions about what is wrong with regulation, and how the various fixes don't fix the problem. The next step, of course, should be to follow Peter Druckers' advice, which is, basically: don't waste time trying to fix what isn't worth fixing, just get rid of it.

Okay, we now know that the old regulatory scheme provided little reward for efficient operators. As a result, consumers, as a whole, probably paid too much for the service. Introducing competition will force operators to lower their costs and their prices. But that's not the whole story, even though that's all we hear about. That's only half the picture. Remember those graphs in economics 101, the ones with supply, demand and prices and costs curves? We want consumers to buy the low cost products, and we want producers and consumers to react to prices in a way that causes the economy as a whole to run efficiently.

Back to the books. J.M. Clark put matters in simple but lengthy English:

> Economic efficiency consist of making things that are worth more than they cost, and it is the peculiar characteristic of private busi-

> ness, under a competitive system, to seize and exploit any opportunity to achieve this desirable end. Thereby... it tends to produce as much of everything as can be produced without driving value below cost...
>
> For example, if people undertake to make more...than other people will pay for, the... business will become unprofitable, and the surplus of labor and resources... will look for something else to do... Thus they are placed where they can do the most good—economically speaking. If a business cannot make a profit, that is a sign that some of the resources it utilizes are not in the right place.[13]

I finally turned to the *Oxford* in search of brevity. First the physical and mechanical definition of "efficiency":

> the ratio of useful work performed to the total energy expended or heat taken in[14]

and the definition of "efficient"

> productive with minimum waste or effort[15]

Now, those definitions represent goals not only for the electricity suppliers but also for consumers, in fact for the economy as a whole.

In a market-oriented society, producers judge the value of resources by their prices, and they strive to substitute lower cost resources, if possible, when they make the product. Customers buy more or less of a product depending on its price, and they, too, will look around for lower cost substitutes. If consumers want a product badly enough to bid up the price of the existing supply, the higher profit on the sale will encourage other manufacturers to produce similar products, and price will fall as the increased number of manufacturers vie to sell more products to the same number of customers. That's the summary of a course entitled "Microeconomics for Simpletons."

The point is this: if you want an efficient market, you have to let prices change in response to supply and demand for the product, and in response to changes in the prices of resources used to produce the product, and you must make sure that all consumers and producers see the prices, and can respond to them.

CURRENT ISSUES

If our goal is to reduce prices, and nothing more, principally by legislative *ukase*, we will not increase efficiency in the economy, and the price control formula may create shortages or misallocation of resources, just as have other price control schemes. Sometimes, prices should rise. That signals consumers to buy less and producers to increase output. Policymakers worry, nowadays, about global warming, inability to site power plants, a shortage of transmission facilities. We should not artificially lower prices, increase demand and exacerbate the problems, but rather encourage efficient production and consumption practices.

In June 1998, in the Midwest, the price of electricity purchased in the bulk market rocketed straight upward. Politicians and buyers howled like stuck pigs. They wanted price controls. What was the problem? Shouldn't price go up when demand exceeds supply? You do get the feeling that a lot of reformers really do not like markets.

I think a major part of the problem, precisely, was that most of the market participants could not react to price signals or never saw them. The ultimate consumers, who took the electricity, did not see price signals. The actual buyers of the power, the utilities, saw the price signals, but had no way of conveying them to consumers, and had an obligation to find the electricity, no matter what. The people who ran the network, who had to take steps to assure reliability, cut off transactions based on an arbitrary formula, rather than on the basis of who valued the power the most and the least.

Interruptible customers, actually interrupted, squawked, but they also argued that they suffered from unnecessary interruptions triggered by arbitrary rules. You had a lot of unhappy people out there, some saying that the market didn't work. To me, a large part of the problem came from not fully utilizing the market mechanisms. I don't think that the problem would have reached the proportions that it did, if customers could have reacted to real time pricing and if the transmission customers had sorted themselves, in advance, by levels of value for transactions.

We need to think, too, about the trade-off between transmission and generation. In order to serve consumers, suppliers can build power plants near the consumer, or transmit electricity from somewhere else to the consumer. Presumably suppliers pick the cheapest alternative, and consumers gain from the lower costs.

However, in the existing half regulated industry, price controls on transmission may discourage investment in transmission even if it is the cheapest alternative. What's worse, as a result of the limited expansion possibilities of the transmission network, electricity generators could take advantage of the inability of outsiders to reach their markets, and jack up prices.[16]

In addition, consumers will have to choose between distributed resources and grid-based services. We do not want them to waste society's resources on new equipment, if the grid-based supplier's costs are lower. But we must consider the likelihood that the consumers will make those wasteful decisions if the grid-based supplier charges a price well above cost in order to generate profits to support some regulatory-approved activity.

Finally, are we throttling the introduction of technologies that could lower costs, improve reliability, increase competition in the market, and mitigate environmental damage because utilities cannot figure out how to justify the investments during the transition period to the competitive era?[17]

The average utility CEO, nowadays, is a lawyer or a bean counter, and the average regulator is a lawyer, so they may not appreciate what technology is out there. They would, if they had to compete with outsiders for all aspects of the business. Consumers would, too. I have a cell phone, a fax, an answering machine, a computer, a burglar alarm that talks to me, a plastic card that provides me with access to cash at any time, and my local electric company provides me with a 19th-century service and its competitor offers me a 19th-century service accompanied by discounts at a chain of budget bars.

We're about to enter the 21st century, some of you may have noticed, and I'd like to see 21st-century products from firms using 21st-century technology.

CONCLUSION

So, where's the beef? Right now, it looks as if the people in the kitchen are eating the hamburger, and they served us an empty bun and the health inspector won't issue a permit to the restaurant that wants to open next door because it doesn't fry everything in lard as required by the 1932 amendments to the city restaurant code.

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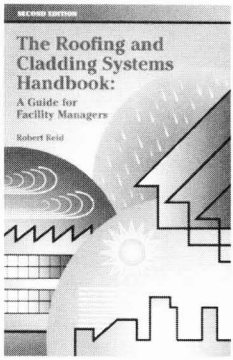

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Well, those carnivores out there know that the meat exists, they know that someone will sell it to them, and they won't wait for the health inspector. That's my prediction.

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