

HARVARD UNIVERSITY  
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

Harvard Electricity Policy  
Group



Center \*Business and Government  
79 John F. Kennedy Street  
Cambridge, Massachusetts 02138

HARVARD ELECTRICITY POLICY GROUP SPECIAL SEMINAR

**Residual Monopoly Services: What Are They? How Do We Regulate Them? And How  
Can They Be Integrated With The Non-Monopoly Sector?**

William Penn Westin Hotel  
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RAPPORTEUR'S REPORT

*The regulation of residual monopolies that remain even after other aspects of the electricity sector are opened up to competition will remain an important topic. Is cost based regulation outmoded and unsuited to the task or does it remain viable for purposes of regulating such residual monopolies as retail distribution services? What lessons can be learned from other industries as well as from other countries? Are they useful and practical examples for the electricity industry in the United States? What are the best incentives for promoting efficiency and competitive markets in the absence of full competition? How can regulators design meaningful incentives that balance the goals of consumer protection, quality of service, and market efficiency? What makes incentives credible? How can regulators best balance stability and flexibility in the regulatory scheme?*

**First Session: Experiences in Other Countries and Industries**

First speaker:

The initial price caps for electricity distribution companies in England and Wales were structured not actually as  $RPI - X$ , but  $RPI + X$ : in effect, they provided for price *increases* during their first year. The companies achieved greater efficiency improvements than the government had

anticipated. Clearly, these efficiencies needed to be accounted for in resetting the price controls. Since the introduction of price caps five years ago, the regulator has revised them downward nearly 10% per year in real terms.

One of the merits of price caps was their relative transparency compared to profit regulation. In practice, however, companies'

motivations in changing their prices have not, in fact, been clear. In setting their prices, companies had to forecast both movements in the RPI and in demand. By nature, the companies' forecasts were ambiguous. Compounding this uncertainty was over- and underrecovery relative to forecasts (which had to be corrected in subsequent years) and "rebalancing" (ie, changes in the rate structure). Together, these factors have made the reasons underlying the actual price changes faced by customers intransparent. As a consequence, the possibility of once again making prices sensitive to the level of profit has been discussed. If this is pursued, examining the effect on incentives would be important. To the extent that a system shares the benefits of efficiency improvements with customers, the incentive to achieve such improvements in the first place would be reduced. Also, if customers share in any benefits, why shouldn't they also share losses?

Takeovers in the British electricity system are in the spotlight these days. The threat of takeovers should be welcomed because it is particularly important to have competition in capital markets where competition does not exist in the profit market. Also, new ideas--not just from other industries, but from other countries--are essential to the sound performance of the industry. At the same time, takeovers raise three concerns, which I believe have been satisfactorily addressed in license conditions:

- (2) Would companies making takeover bids expose utility customers to profits and losses elsewhere in their business?
- (3) Would outside companies prevent the local company from getting the resources that it needed to invest in the system?

- (1) Would it be impossible for the regulator to get information that he required to carry out his duties?

Customer service has also been a concern under competition. At the time of vesting, some 18 quality standards were established to (at least) maintain pre-privatization service levels. According to these criteria, standards of service have steadily increased since privatization.

Importantly, competition in supply reinforces competition in generation. As is well-known, competition has been phased in: by 1998, all 25 million customers in the UK, regardless of the size of their load, will be allowed access to competitive supply. Introducing competition in supply, eg, in metering and billing, has been largely successful.

What price changes have occurred since privatization? Medium-sized customers have enjoyed price reductions of between 10 and 15%, while most large customers see reductions now of about 18%. Small customers have benefited as well, due in part to lower fuel prices paid to British Coal. Domestic customers' prices have decreased between 9 and 10% since privatization.

What can we expect from the extension of competition to domestic customers below 100 kilowatts in 1998? These consumers constitute a market of nearly 10 billion pounds annually. About 60% of this sum is attributable to the functions of generation or supply (metering/billing), and hence is now--or will be in the future--subject to competition.

Wherever possible, one should introduce competition rather than simply rely

on price regulation. Increasingly, preparing for competition has entailed a number of tasks for the regulator. The regulator needs to set a time table for the sequence of events leading to competition; clearly define his responsibilities; get the public electricity suppliers to draw up trading arrangements which are subject to his approval; establish ground rules that govern how generating companies and suppliers will interact when, for example, customers choose to change suppliers; and specify customer service standards in company licenses.

I don't believe that customers should be asked to pay additional charges relating to the introduction of competition before 1998. After that time, such charges ought not to exceed one pound per customer per year. This amount is surely much smaller than the benefits that will be realized from competition.

#### Second Speaker:

I'll concentrate on issues of distribution and supply. In England, it should be noted that we distinguish between *distribution* (ie, use of the local wires) and *supply* (ie, retail activity). First, what is the nature of the residual monopoly that will likely remain in electricity markets, however much competition is introduced? Clearly, the wires remain a monopoly in need of some oversight in the long term, while regulating the area of retailing is more controversial. Creating competition for large consumers has been relatively straightforward, but doing so has raised issues of cross-subsidy between large and small consumers, and between competitive and noncompetitive market segments. On the whole, however, this has been managed without great controversy.

Much of supply regulation does not

actually involve regulating monopolies, but rather the problems of regulating competition. In our regulatory system, we pay little attention to the classic goals of economic regulation: political economic goals, equity, and public service ideals. This is because the regulatory framework, the *Electricity Act of 1989*, which established the framework for privatization, forbids consideration of these ends. Moreover, this legal framework says that economic efficiency is virtually all that matters: other goals are marginalized. The underlying argument is that competition is the primary vehicle by which benefits will be delivered to consumers. Economic efficiency is neutral with respect to the equity dimension; this narrow focus is something that I believe will change.

Next, I'll consider the regulation of the remaining monopolistic component of distribution activities, the wires business. The principal competing approaches are well-known: rate of return regulation and price controls. The distinction between the two may not be as sharp as some have argued, since, in my view, the political system insures that observed rates of return from each regulatory regime converge to comparable values in the long run. Rates of return are constrained by the competing pressures of, on the one hand, bankruptcy of the suppliers and, on the other, political forces. Price controls have significant efficiency advantages over the rate of return approach because the former allow companies to keep the fruits of cost-cutting activities. A problem arises in that towards the end of the period over which controls are implemented, companies will have an incentive to conceal their financial strength or to conceal the possibility of large potential efficiency improvements to lessen the stringency of controls in the next period. One remedy

would be a shorter interval between the resetting of prices. On the whole, the implementation of price controls in England and Wales has overemphasized stability at the expense of flexibility.

Corporate taxes have the potential to generate unacceptable efficiency losses in the British electricity industry. Under pure price controls, we now have a marginal tax rate on corporate profits of around 30%. If (for example) a 50/50 sharing mechanism beyond a certain allowable rate of return is instituted, then the effective marginal tax rate will rise to at least 65%. This could well have some serious efficiency consequences.

Implementing yardstick competition for the monopoly wires business is problematic because nominally similar companies may actually be quite different. Furthermore, because of information asymmetries, it is difficult for any regulator to judge how different companies really are and therefore what baselines should be. The experience of England and Wales has been relatively fortunate in that a single regulator has had access to detailed information on companies' activities.

I will now address the regulation of the more competitive retail segments of the industry apart from the wires business. Cross-subsidies inevitably arise as a major problem in this context. In England and Wales, we have had cross-subsidies in favor of large (currently competitive) consumers largely to support our indigenous coal industry. The cost of this support falls most heavily on household consumers but is small in magnitude.

In regulating the fully competitive retail market, there are three major issues:

- (1) The removal of cross-subsidies as competition takes place.

There is good reason to suppose that a number of groups will be disadvantaged by this reform: rural consumers, those who tend to pay late, those who don't have bank accounts, those with small and/or peaky demands, and those who pay by prepayment.

- (2) The obligation to supply / supplier of last resort.

This is an area where the regulator will continue to have an important role.

- (3) The relevance of recent competitive experience in the gas market.

Largely price-based competition in the retail gas market has resulted in suppliers offering customers a roughly 20% reduction in their

gas tariff to switch suppliers. Such price cuts are unlikely to be seen in electricity. Nonetheless, some asymmetrical price cuts may be expected, whereby larger consumers will get much better terms than smaller ones.

Finally, there is a potential need to jointly regulate gas and electricity because the industries are becoming ever more intertwined.

#### Third Speaker:

I will discuss the various forms of regulation implemented--often on an experimental basis--in the United States telecommunications industry. The monopolies certainly aren't "residual" yet; competition is just beginning in local markets and it will probably take off quickly for urban areas. Regulation of the U.S. telecommunications industry has evolved from rate base rate-of-return regulation to revenue/profit sharing plans to price cap regulation. In this

progression, distinctions between noncompetitive, partially competitive, and fully

competitive basic services have become increasingly important, as well as the definition of basic services themselves. Distinguishing different sorts of services is perhaps more important in telecommunications than in electricity; in the latter, the variety of services is somewhat smaller.

Some 13 states have or have had some variety of revenue/profit sharing, and something over 20 states have implemented price caps. As for details about the structure of the price cap plans, states use either the gross domestic product or gross national product price index as their inflation index. The productivity adjustments range from one to five percent. Other common provisions include rate freezing, quality of service adjustments or standards, and infrastructure investment plans.

Colorado, as one interesting example, has a very elaborate service quality plan based on an index of service quality standards; the company is penalized if it does not meet the standards. Unfortunately, Colorado has not been able to enforce the service quality penalty so far because the company's earnings were insufficient.

Michigan has taken a slightly different approach than most states. In Michigan, companies, *per se*, are no longer regulated, rather, services are. Regulators do not look at who is providing the services, which is a sound practice if you're headed toward a competitive market with a number of providers for each service. This approach has resulted in price increases in some of the services that used to be considered monopoly services. Michigan Bell (now Ameritech Michigan) and the smaller companies have done very well. Revenues have been excellent, while

investment has declined, in part because the costs of some infrastructure investment have decreased. New services didn't appreciably increase in number and the work force for this Ameritech company declined.

Next, I'll offer a brief review of the growing literature on price caps, focusing on a number of specific issues.

### (1) *Economic efficiency*

For intrastate long distance, toll prices seem to be higher under incentive regulation. Incentive regulation in the U. S. tended to improve total factor productivity; one study cites an improvement of 2.8%. Another study looked at data from several countries and found that prices have fallen. There, the effect on productivity was ambiguous. Interestingly, the expected rate of return turned out to be a determinant of the price cap formula instead of vice versa. This is explained by the fact that expectations of high profits lead regulators to adjust the productivity factor accordingly.

### (2) *Infrastructure deployment*

Here, the question of interest is whether price cap regulation helps or harms deployment of advanced telecommunications services and the underlying infrastructure that supports them. Unfortunately, the several studies done to date have yielded conflicting results. The findings tend to depend on who is paying for the study. Some of our own work has suggested that the company in question--particularly, the company's corporate strategy--has a stronger influence on how much advanced infrastructure was deployed than the type of regulation that was in effect. Several companies have tried to make the case that, under a price cap plan, they would invest in certain advanced infrastructure that they otherwise would not deploy.

### (3) *Quality of service*

Even under rate base rate-of-return regulation, there appears to be a trade-off between profitability and quality and an even stronger trade off between productivity and quality. There is some evidence that explicit service quality standards do work. Moreover, when states with low service quality enact service quality standards, they tend to catch up with other states. Under such standards, quality improvements occurred along with improvements in cost efficiency. States with incentive regulation but no quality of service standards performed no worse in quality terms than states having no incentive regulation.

To conclude, under alternative regulation, prices have tended to go up, while productivity may have improved. Basically, companies now have incentives to avoid padding their rate bases and to cut costs so as to make them more efficient. Infrastructure has, in fact, been added at a pretty steady rate. The telephone companies are certainly very profitable, judging from the expected rate of return for the Bell operating companies and the IFCs. When competition does arrive--and it is not here yet, by and large--companies will compete on the basis of quality, especially on reliability.

#### Fourth speaker:

I will offer some comparisons between the experience of privatizing the electricity and the gas industries in Argentina. When privatization was undertaken, these sectors not only faced the same macroeconomic environment (eg, hyperinflation), but also shared some common sector-specific features: poor quality of service, overstuffed companies, political influence on company decision making, and substantial cross-subsidies

between customer groups. The Argentine government's objectives in privatization were to promote competition, to transfer firms' assets to the private sector, and to regulate remaining natural monopoly activities (for which new regulatory agencies would need to be created). The task before us was thus not merely privatization, but also reorganization of each industry and recasting of the government's role vis-a-vis the industry.

In both electricity and gas, privatization was accompanied by a deconcentration of the industries. Prior to privatization, 95% of gas production was in the hands of one company. Post-privatization, the largest company accounts for 65%. In electricity, the largest private generator now accounts for some 33% of production. Both sectors have market pricing, whereby in electricity, pass-through of fluctuating energy costs is permitted automatically if the energy is procured in the spot market.

Regarding electricity transmission, a dispatch coordination unit governs the use of the transmission system. The dispatch rules are subject to auditing by the regulatory agency. There are three transmission companies in the country. The largest company manages the national grid and the other two operate independently of this grid. Both electricity and gas transmission systems have regulated rates, open access, and restrictions on transmission company activities. The transmission companies can only transport their respective commodities; they may not buy or sell gas or energy. Open access is restricted in some provinces because electricity distribution has not yet been privatized in all provinces.

Distribution companies (some of which

are privately and some provincially owned) have an obligation to meet the demand in their concession areas. For electricity, there are no predetermined investment requirements. Distribution capacity is subject to open access for certain third parties, in that any large buyer can buy electricity directly from the producer. There is a maximum rate (ie, a price cap) for each type of distribution service, whereby companies may offer discounts. The price cap is implemented with the familiar RPI - X formula. In electricity, X has been set to 0 for the first ten years after privatization; in the gas sector, it is set to 0 for the first five years. Value added is indexed via a combination of the producer price index and the consumer price index of the United States, since rates are fixed in U.S. dollars.

One distinction between gas and electricity regulation is that gas is regulated solely on the federal level, while electricity is generally subject to two tiers of regulation. In the gas sector, then, a single federal agency regulates gas transmission *and* distribution. In the case of electricity, federal regulation is the most important, but there is provincial regulation, as well.

A number of quality of service standards were included in the privatization contract. Because the quality of service had deteriorated significantly prior to privatization, the required minimum quality level was ratcheted up over time. Non-compliance with quality standards is penalized with fines. The schedule of fines is fully specified in companies' contracts, so that there is no room for discretion by the regulatory authority. In addition, proceeds from fines are passed on to consumers. Technical quality is defined in terms of voltage level and stability, and quality of commercial service pertains to the handling

of customer complaints, connection times, estimated billing, etc.

As for post-privatization performance, technical and non-technical losses and outages have been reduced, lower prices to consumers have been achieved, and the government is collecting larger tax revenues from the companies in both sectors since these companies are now profitable. Looking more closely at consumer prices, residential prices have fallen some 10 percent since 1992. Residential prices in the privatized national companies are 40 to 50 percent lower than in the (still public) provincial companies. Small industrial/commercial rates in the privatized national companies are 10 to 15 percent lower than those in the provincial distribution company. The large-user<sup>1</sup> market has been extensively deregulated. The Secretary of Energy decreased power requirements for large-user status by a factor of 50, from 5,000 kW to 100 kW. Because of the threat of bypass, these users are well-positioned to bargain with distribution companies for a favorable rate schedule.

Service quality has also improved since privatization in 1992. As of January 1993, the frequency of interruption was 13 times per customer per year; by January 1995, this figure had dropped to 4. Looking at the length of interruptions to customers, this was 22 hours per customer per year immediately after privatization, and is now only six hours. Finally, power unavailability has decreased from 52 percent in 1992 to 28 percent in 1995.

The reduction of non-technical losses (ie, theft) deserves special mention, not least

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<sup>1</sup>i.e., those consumers that may purchase directly from producers.

because cracking down on them was politically sensitive. While residential theft was usually the most obvious, industrial theft was more important quantitatively. When price caps that took no account of these losses were introduced, the companies were quick to improve their policing of theft. Especially in poor suburbs, the government stepped in to help remedy this situation, in that municipalities financed power connections for poor people.

In closing, the future tasks facing the government in both of these sectors include introducing more competition, integrating energy markets with neighboring countries, promoting efficient system expansion, and coordinating regulatory efforts between the two sectors.

#### Discussion:

Are there efforts in the United Kingdom to unbundle additional functions from the distribution monopoly and make these competitive?

OFFER is trying to make as many services open to competition as possible. It is possible to introduce more competition in *metering* (ie, the provision, servicing, and reading of meters) and in *connections to the system*, that is, making sure that those who want to have a new connection to the system or to extend their existing one can get competitive price quotes for these services.

How on earth can you get customer disconnections to zero? Is it accomplished simply by giving everybody a pre-payment meter so that when they don't have money, they disconnect themselves?

In the UK, this refers to poorer customers that find themselves unable to pay, whether it be due to a temporary shortage of income, illness, or whatever. The regulator has had two responses. First, companies have been required to institute repayment schemes for debts that are geared to the circumstances of each customer. Second, as you've mentioned, has been the use of pre-payment meters. It is possible, of course, that someone running out of money temporarily would use either less electricity or no electricity with a pre-payment meter, so the concern about self-disconnection is justified. It's not the business of the electricity company to provide electricity for people who are simply unable to pay for it, but rather a responsibility of the

government. OFFER requires of the companies that they be responsive to people in such situations and don't simply disconnect them. On the whole, customers have welcomed the provision of these meters since they are now better able to budget for the use of their electricity.

In Argentina, industrial consumers used to subsidize residential consumers. Privatization, however, necessitated a rate structure more in accordance with the economic costs of provision of each service. At the same time, the government still wanted to subsidize residential users in the south (that is, in very cold areas), and also retired people below a certain level of income. These subsidies are transparent in that they are included explicitly in the national budget. The (electricity or gas) distribution companies are given a check and they provide rate discounts. It's not the regulator who decides on the rate structure, but the politicians. Nevertheless, disconnections do happen anyway and, rather than respond with regulation, the distribution companies themselves have tried to work with



the municipalities to minimize these through payment plans, perhaps with municipal assistance. The municipalities are best acquainted with individuals' situations.

In the UK, companies charge a higher price for electricity to customers using pre-payment meters, up to £20 a year more than average. There are indeed cash flow benefits from earlier payments, but they're offset by the additional costs of providing and servicing these meters.

It is not coincidental that both presentations from England have not mentioned the term *deregulation*, which one hears much more in the United States. Our experience is that competition is not synonymous with deregulation. There are many continuing regulatory issues for the residential market. Whether these will be addressed in the long term by a third-party regulator, whether some kind of self-regulation will be established, or whether indeed some powers may revert to government (which might happen if, for example, cross-subsidy issues become politically more acrimonious) is unclear. What is clear, however, is that competition and deregulation are not the same thing.

In the course of Argentina's privatization, the prime objective was to, wherever possible, rely on competition while avoiding the need for a regulatory authority. Where the regulatory authority exists today, its role is not to replace competition, but to actively push competition further. Despite the existence of relatively few producers in the gas sector, for example, the regulator has created incentives for distribution companies to make economical purchases of gas.

In the UK, having a five-year fixed price control system was a serious mistake. While an annual system is too frequent, the time period for which price controls are fixed needs to be shortened. This would put less pressure on the regulator to get it exactly right, and assuage fears that the companies will either earn too much money or get into financial trouble, should forecasts be seriously wrong.

One year between reviews is too short; most efficiency improvements could not be amortized in a year. Three years would be debatable. Four years is certainly feasible, and has been adopted in the case of electricity for the National Grid Company. The telecoms regulator inherited a five-year regime and decided that, next time, four years would be better. The uncertainty is greatest when you are privatizing a company that has been in government hands for many years. You have no idea how inefficient it is, or how conditions are going to change. There is therefore a strong argument at the outset for a short review period. Once the major inefficiencies are squeezed out, longer periods between reviews are conceivable, particularly in an industry where technological progress is not very rapid.

Regarding "taking <sub>costs</sub> off the table," a major attraction of the RPI - X price cap scheme was that it circumvented the lengthy and costly proceedings surrounding cost determination. Increasingly, however, we have heard customers saying, "Where are these costs? Put them back on the table so we can see them. How do we know that you regulators have got the price control right?" One American consultant has recommended that Britain follow the Americans' example by letting everybody examine all companies' costs

in great detail. There is increasing debate about these matters. At any rate, it seems unavoidable that, when the price cap is set, we need to have most costs placed on the table, although we might not want to have these costs displayed every year after that.

There is, however, a more fundamental point about the transparency of costs. When we're revising the price controls, what we've got on the table *are past* costs. What we are actually interested in, however, are the *future* costs.

There is a regulatory policy trade-off between using the productivity offset, (the "X" factor) as the regulatory variable that controls how productivity gains are shared with the consumers, versus having an explicit sharing mechanism. It's not clear that we would have been better off using empirical productivity offsets combined with an explicit sharing mechanism as part of the price cap formula. Empirical productivity gains were mostly irrelevant in Britain, since past experience was not a useful guide to what a company could do after privatization. Britain's price cap mechanism allows gains to be shared at a specified rate over time, whereby the rate is periodically adjusted. Alternative suggestions include processes incorporating automatic sharing on a more continuous basis; these alternatives, however, may provide inferior efficiency incentives. Moreover, companies could manipulate the sharing formula by various accounting devices.

Regulators are in an increasingly strong position in Britain in terms of knowing how price caps work, and are now able to set caps more effectively. If a new, untried mechanism whose nature and effects are unknown were to be implemented, the uncertainty associated

with its use would be significantly greater than that with continuing use of RPI - X. As a result, we'd likely have to implement it for a far shorter period.

Does the British regulator review the rate rebalancing plans and approve them to determine whether they're reasonable? If so, on what basis is the review conducted? If the review is based on cost of service, isn't that tantamount to bringing costs back onto the table, which could then mean that prices are not in fact capped?

Yes, the regulator reviews the rebalancing plans. Indeed, when OFFER challenged the National Grid Company charges, the NGC came up with a schedule for changing the structure of charges over the four years of the control, which was then accepted by OFFER. In the context of the present review of the control, OFFER has concerns about the charges. In particular, there are some cost elements that weren't put into the original calculations. Regarding the distribution business, there was little rebalancing during the first five years. Over the last year or two, however, there have been some significant changes. Companies have decided to look again at their structure of charges and, in some cases, have changed them. Regulators will need to look more closely now to see exactly what the changes are, why the companies are making them, and whether they are appropriate.

So, to sum up, this process does necessitate looking at relative costs. You can't allow a company to use its monopoly power to exploit particular classes of customers. From time to time, and in certain respects, you need to be concerned about the structure of charges. OFFER's arrangement affords

companies the possibility of small changes without explicit justification.

It's clear that Britain has enjoyed tremendous efficiency gains with the introduction of price caps. At the same time, however, there's been the criticism that the RECs, in particular, have benefited far more than have consumers. If you had to do it over again, with hindsight, would you channel more of the efficiency gains to consumers?

It should be noted that there were efficiency gains in the UK electric industry under the old state ownership system. A control was put in place under which the electricity companies had to reduce what were then known as "controllable costs," by a certain percentage every year, which is, in a way, analogous to the current "X" factor. In fact, these costs were reduced by two or three percent a year. Nonetheless, there have been some efficiency and productivity gains since privatization as a result of direct managerial action within the companies. There have been other, exogenous gains attributable the fact that we now pay much less for coal, coal still being the single costliest input for the industry. It is largely because of this good fortune that the current environment in which companies make large amounts of money (some £2.5 billion more per year than before privatization) while consumers enjoy relatively modest benefits has been politically acceptable.

It's certainly true that, after the event, the companies made more profits than expected. The companies also made larger productivity improvements than expected. There was probably scope for reducing capital expenditures more than they allowed, although there are significant differences among companies on this score. Tighter price

controls initially would, of course, have redistributed more of the efficiency gains to customers early on and correspondingly fewer to shareholders; such an outcome would have been perceived as better. The difficulty with regulating by hindsight, naturally, is that people didn't know this at the time. Certainly, the government received as much as the market was willing to pay for these companies. The market wasn't prepared to pay any more than it did pay, and the government felt that it needed to provide certainty of return for five years to attract investors. Secondly, some of the more recent changes have come only with the advent of takeover threats. Such a threat led one company to say in defense that it would borrow an enormous amount of money and pay it out to shareholders in the form of a lump sum payment, thereby gearing up enormously. The market was at first aghast at this, but after thinking about it, this strategy was seen as the obvious response. So, yes, controls could have been tighter, but it's difficult to imagine that anybody else would have taken a very different line at the time.

## **Second Session (afternoon): Alternative Regulatory Schemes: Proposals and Analyses: Cost of Service? Rate of Return? Price Caps? Incentive Ratemaking?**

### First speaker:

I'll present an overview and analysis of some alternative regulatory schemes for the utility industry. Although to date there has been more talk than change, I predict that in the coming years, state commissions will see a growing number of proposals for performance-based regulation (PBR). The fundamental reason behind this heightened interest is that cost-of-service regulation just doesn't work well in the quasi-competitive marketplace. In fact, the problems associated with cost-of-service regulation are magnified under non-monopolistic conditions.

For guidance in designing new regulatory mechanisms, we need to look to the objectives of regulation tomorrow, which may differ somewhat from today's objectives. Foremost in the minds of most regulators is the protection of residential and noncompetitive customers from cost-shifting. Open access is another regulatory objective, including encouraging entry and ensuring access to essential facilities at efficient prices. Another set of objectives includes prevention of anti-competitive activities (eg, self-dealing abuses), and encouraging competition, eg, giving utilities more pricing flexibility and reducing entry costs for alternative service providers. Many traditional regulatory objectives such as reasonable prices and high quality of service are going to remain with us; any sort of PBR plan has to take these objectives into account.

These objectives may, however, be

assured through subsidies; in a competitive marketplace, a surcharge might be imposed on monopoly service. As for reliability, one could argue that the current utility system is gold-plated and that reliability of service is probably too high. Lowering the quality of service might be desirable, if the reduction in benefits were exceeded by the cost savings.

The introduction of competition aggravates many of the problems of cost-of-service regulation. A monopolistic market having regulated prices above marginal cost will result in efficiency losses compared to the competitive ideal. If bypass opportunities are introduced, the efficiency losses grow. Another problem, information asymmetry, also becomes more pronounced as the scope of competition increases.

The alternative proposals under consideration include price caps, revenue caps, yardstick regulation, profit-sharing, partial incentives, and hybrids of price caps and profit-sharing. Evaluating these alternatives, the good ones (depending of course on the details of implementation) are price caps and comprehensive yardstick regulation. If a cost index for the industry can be developed, it can be used in place of the RPI - X formula. One advantage of the cost index is that it addresses many people's concerns that under a price cap, customers' rates will go up when they should be going down. The industry cost index would reflect the decreasing trend of cost in the industry and serves as the basis for the trend in prices. Profit-sharing mechanisms can be classified as "less good, but still OK." Profit sharing lessens the incentive for controlling costs. At least for political

purposes, however, it may be imperative for regulators to limit the profits of utilities in some fashion. Finally, revenue caps and DSM standards, and other partial incentives receive generally bad marks.

So, to conclude, price caps and their implementation should be the focus of future discussions of PBR mechanisms. Importantly, as some of my colleagues have pointed out, PBR is sufficiently flexible to address transition problems such as stranded cost recovery. It should not be overlooked, however, that price caps do have their problems, eg, unacceptable price discrimination, disincentives for DSM, disregard for certain social goals, and inadequate quality of service or reliability.

#### Second speaker:

The whole process of restructuring the electricity industry, like any far-reaching change in economic policy in the economy, is pervasively political. In this environment, any effective approach to reform must build in political reality up front, rather than undertaking frequent and piecemeal interventions to account for political considerations along the way.

What are we trying to achieve with incentive regulation? First, we'd like to create incentives for efficient investments while avoiding the factor bias problems inherent in rate-of-return regulation. Second, we want something understandable and workable. A corollary of this is that *education*, both *of* and *by* the regulatory community, plays an important role. Education of consumers is also essential—education, for example, as to what it means to be in a competitive marketplace and why they should not object to

a high rate of return if prices have decreased and the quality of service has improved. Third, we need to achieve stability and predictability over a sufficient period of time so that investments get made. Fourth, political viability is essential. Concretely, this means a sense of fairness, however defined; avoiding short-term price spikes which typically elicit political reactions; and avoiding cross-subsidies where possible, but swallowing them where they area means to an end. Finally, we should avoid "partial" schemes which try to take the best from several models, but usually send us back to where we started, or worse.

There area number of subtleties associated with incentive regulation that need to be more fully illuminated. The first issue is that of testing these regulatory schemes. There are serious limitations to testing new schemes using *historic* data. Instead, the focus needs to be on the economic relationships that determine future costs and benefits, which are likely to be different from what they were historically. This is all the more important since we're currently faced with rapid change in cost relationships and product definitions. For those few alternative regulatory schemes (some in telecommunications, some in electricity) that have been implemented in the United States, we've discovered that relatively small changes in the parameters set or chosen by the regulator can yield enormous year-to-year fluctuations in allowable prices. Significant volatility in outcomes leads almost inexorably to political intervention in the regulatory process.

The next issue is the extent to which costs are under management's control. In some of the plans that have been implemented, costs to which productivity factors are applied are not within the control of management. A

benefits in terms of rate reductions attributable to price cap regulation in Pennsylvania are very modest; we have seen a rate reduction of about 12 million dollars over the same two-year period.

The basic lesson that we are learning in Pennsylvania is that while *cost-of-service regulation* has weak efficiency incentives, a significant attraction is its positive influence on infrastructure development. This latter issue is particularly important in telecommunications. In the electric industry, in contrast, generation and transmission capacity are adequate, so that price caps are perhaps an attractive means to increase efficiency.

This state has implemented three "partial yardsticks" in its regulations governing electricity and gas service. There is a nuclear performance factor, a spot gas purchasing performance factor, and a (gas) capacity release performance factor. Unsurprisingly, the companies that volunteer to implement the partial yardsticks tend to be the strongest performers. The companies are essentially seeking to convert consumer benefits in the form of lower costs into higher profits. The result can well be that higher profits are realized thanks to higher rates. Few companies come forward with yardstick proposals in areas where they perform poorly, which is unfortunate. If companies would identify an operation which they are not now performing well and propose an incentive plan for improvement, it would be much easier to implement a performance-based model benefiting both consumers and shareholders.

While incentive regulation can bear importantly on service costs, the focus ought to be, more broadly, on quality-of-service issues. For example, we need to ensure that

the competitive part of the business does not have a negative influence on the remaining monopoly elements. Too many customers opting for new generation providers could cause erosion of distribution or transmission service, for which customers have no choice. The best protection against these problems might be a scheme similar to the comprehensive customer service standards implemented in the United Kingdom.

My last point concerns the treatment of stranded benefits. Price caps alone, obviously, don't address the question of universal service funds, conservation programs for low-income individuals, renewable portfolios, or other potentially stranded benefits. One of the things that I'd like to see developed is an auction system or alternative means to inject competition into the provision of these functions. The opportunity to be the provider of last resort should be a competitive opportunity, rather than simply designate one company as the *de facto* provider of last resort. Such a scheme might well drive down the cost of universal service subsidies over time.

#### Discussion:

In a rising cost market, the political system might well lose affection for the price cap mechanism, or, alternatively, the mechanism could grow ever more complex as the stakes in measuring future cost become greater.

The main problem in the U.K. was not that the RECs were earning a lot of money, but that customers' rates didn't go down that much. A seminal study of utility regulation basically concluded that, before 1970, the U.S. had price cap and not rate of return regulation.

Utilities were earning quite a lot of money, but concurrently, prices were decreasing; occasionally, utilities would even request rate reductions. The familiar political wrangling associated with rate-of-return regulation first arose later when the industry became an increasing-costs industry.

I don't see what is wrong with revenue caps. In my utility, revenue caps are producing lower rates than would price caps.

Revenue caps give the utility incentives that are at odds with those of a competitive market. It can lead utilities to promote too much DSM, and not to promote sales when they should. It uses bills rather than price as its measure of consumer welfare, which is wrong. Other serious problems include the use of a "dead band," meaning that if actual rates differ from a target by less than a certain amount, the company gets to keep all gains. (This is sometimes termed a *regressive* sharing arrangement.) It is easier for utilities to make efficiency gains early on. As time goes on, such gains become harder to achieve. Why should all the initial gains go mostly to the shareholders? Once gains become harder to realize, a company might quit exerting so much effort at saving, especially if gains are shared with the customers.

The fact is, however, that incentives work. The performance measures in our PBR not only impact the company's earnings--they also figure in the compensation package of every employee. . In comparing regressive versus progressive profit-sharing, we should look at the starting point, namely, traditional regulation. Under the latter, if the companies reduce their costs, they keep 100% of the reduction. Introducing any sharing band at all represents a limitation on company returns.

In what sense does PBR work? For whom?

It works for both shareholders *and* consumers. It works for consumers in that among the 28 utilities surveyed, there was only one company whose rates were not lower under PBR than they would have been under cost-of-service regulation. Second, PBR has apparently been very effective in starting to change utilities' corporate cultures, particularly where regulatory incentives are tied to employee incentives within the company.

We need to be cautious in selecting a variety of social programs to be folded into new systems of regulation. When distribution regulation is designed with numerous other objectives in mind, I worry about the impact on the transition to competition elsewhere, particularly in generation. Suppose for example, that the UK had incentive rate making for the RECs that tracked their success in being low-cost purchasers and in arranging long-term contracts. This might create incentives that discourage entry in that business, ie, it could hamper competition in the generation market. This might even be what the regulator is concerned with in his MMC referral on vertical integration.

I know of a case in which a wire business disco was ready to install standard, state-of-the-art, single-dial meters for most residential communities at a time when aggregators were thinking about introducing time-of-use rate structures. The aggregators would have to incur the additional costs of the metering to enter the business. They argued that metering should be left out of the wires business to give other parties the chance to offer a metering capability consistent with their portfolio of supply services. In this situation,

the very definition of the wires business immediately affects the barriers to entry facing aggregators or marketers.

Price caps that bring about extensive cost-cutting in distribution put quality of service at risk. Quality deterioration could very well create backlash against the whole reform enterprise. The problems created within distribution by such reforms would, unfairly, place the market-oriented reforms in generation in a bad light.

The starting point for this session was to consider how we regulate the residual monopoly. Strictly speaking, there is no such thing as *the* residual monopoly. There are a series of residual monopolies. They vary geographically and will vary over time. Whether we can define a price index and a baseline that's unique to the particular type of cost to be recovered, or whether we have to resort to a broad-based index to reflect a bundled set of costs in a residual monopoly are empirical questions. It seems, however, that the burden of argument will rest with those who see a unitary residual monopoly.

We can learn from the gas industry which is farther along than the electric industry in its unbundling of different services. In the future world of natural gas, the LDCs will be like distributors. Interruptible customers or large customers located near a pipeline might say, "Well, if the LDC charges too much for distribution, we'll buy off the pipeline, or we'll switch to another fuel." The analogy with electric, of course, is that some customers may say, "If distribution service costs too much, we'll co-generate, self-generate, or we'll substitute some other fuel for electricity."

How is a benchmarking system that

depends on a reference to the universe of utilities going to serve the regulatory process?

To the extent that it's exclusively reserved for individual states to decide on retail access, benchmarking is going to be very difficult. Even where utilities and market conditions are similar, making costs transparent to facilitate useful comparisons is problematic for the development of a competitive market. We don't want companies to have the detailed information about one another that an attempt to benchmark the distribution process would generate.

We've focused today almost exclusively on distribution companies. Does anybody have any comments about transmission, the system of control, standards for interconnected control areas, the problems of specifying reserves, or procedures for setting and assessing penalties for those who don't obey the rules?

These issues have been left out for two reasons. First, upon comparing the numbers, transmission turns out to be relatively inexpensive, costing some 4 mills plus possibly an additional mill for generation run out-of-dispatch for transmission or congestion reasons. Second, the fact that transmission is regulated by FERC rather than by state commissions has left it out of the discussion. FERC's objectives of comparable rates and open access differ significantly in their effect from state regulators' concerns with O&M costs or defining the best uses for new capital.

Five years ago, we had one bundled product called delivered power, which we considered a residual monopoly. Three years ago, we decided that we could separate out generation and transmission, yielding a



competitive product and a residual monopoly called transmission. Today, we have identified some ten to twelve elements comprising what used to be called transmission, most of which are competitive. One to three of these elements maybe residual monopolies. Most of what has been historically bundled together under the so-called "residual monopoly" can be unbundled by new market entrants who provide services in ways that we haven't thought of before.

The performance based regulation discussed here is designed for the transition from a regulated monopoly to a more competitive situation for bundled services. PBR can deal appropriately with stranded costs: once you've set price caps giving the utility the incentive to be efficient, stranded costs will come down, over time, to a reasonable level. Moreover, companies will then have strong incentives to divest themselves of other businesses and become wires businesses with separate generation components. Would we still want to use price caps on the distribution company once the transition is complete?

We don't advocate a price cap scheme for our disco because we sell the product at anywhere from three quarters to a penny and a half less than our in-state competitors. A portion of this difference is in distribution, although the majority of it is in generation. Resetting starting points for all companies in the state would mean immediate price increases for many people. In addition, the chances of things going wrong with service quality are just too great under a PBR scheme. Incidentally, the incentives for efficiency under cost-of-service regulation are enormous today. Companies actually go to great lengths to manage their costs aggressively and to avoid

coming to commissions with rate cases, which also pleases their investors.

Cost-of-service regulation is effectively like price cap regulation; however, it's an open question whether price caps are an effective form of regulation for distribution alone. In telecommunications, much of what is being accomplished has to do with pricing flexibility. There, facilities are used to create new products and services within what is basically a monopoly, while the same company is engaged in marketing services competitively elsewhere. Our speakers from Britain argued that even the service drop to the house needn't be provided by the regulated monopoly.

How can you avoid a cost allocation procedure when moving to unbundled services? Don't you have to file a rate case to determine what your initial unbundled distribution rate will be?

Many companies expect the unbundling process on the generation <sub>side</sub> to be extremely painful. It will inevitably make what happens on the distribution side unimportant. Some \$4 billion are tied up in generation, while distribution accounts for only some \$50 million. There are a host of questions surrounding classification of these functions. How much of customer service should *not* be part of a wires distribution charge? How much of what they do constitutes selling? That's very difficult to decide.

These issues pale in comparison with the question of generation transmission. I refer to the stampede to reclassify generation costs--particularly those that are above-market--as transmission costs. It's taken the FERC ten years to determine whether excitors on a generator are appropriately assigned to

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transmission costs, to say nothing of whether a gas turbine sited to maintain voltage in some area should be counted as transmission. Once such questions are decided, people will lobby hard to get costs reallocated from competitive markets into the core markets. Distribution may see similar efforts on a smaller scale.

Isn't dispersed generation the *real* cap that distribution faces over the next ten to fifteen years as technology makes it more competitive?

The nature of dispersed generation investments imply that, for a long time to come, owners will still rely on the existing distribution network to function properly, and will not displace it.