Special Session on the Future of Regulation
Harvard Electricity Policy Group
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Rapporteur's Summary

Topic: Looking Ahead to the New Electricity Market: What Should Regulators Do?

Relatively soon, electricity restructuring will be more in place than in process. The new electric market will present a new challenge to regulators. In popular terms, the proposition is simple: As competition increases, regulation decreases. The practice, however, may not be so simple. What criteria and standards should we invoke? How will we know that competition is working? What evaluative measurements will be needed? How should the measurements be used? How much regulatory oversight should there be in the new market? Is the government's role simply to react to anti-trust problems as they arise, or should it actively intervene to assure an acceptable level of competition? What powers and responsibilities should regulators retain? What forms of regulation might apply, and where? What is the appropriate balance between competition and regulation? In short, what should regulators do?

Morning Session: Identifying and Defining Acceptable Levels of Competition

Speaker One

What should regulators do about generation? Break the vertical links and get generation in the hands of efficient operators. There may be a lot of local market power issues, so the idea is for regulators to auction off the assets, especially so there can be stranded cost recovery. I argue doing it sooner rather than later because you get the first mover advantage.

Generation counts for about 74% of the cost of investor-owned utilities. Transmission, including both plant and operating expenses, only adds up to about 7%. It is not terribly costly in the overall mix, yet is going to be the platform for competition. The wholesale/retail partitions we have had for 60 or 70 years are irrelevant. The point is to unify the jurisdiction of transmission at the federal level, use an ISO/ RTG governance structure,

move to capacity reservation tariffs, federal siting authority, and use computer-assisted short term markets with choice. We will have to pay a lot of attention to the ancillary services markets, which have been getting very shortchanged. We should use this structure to create market surveillance. My one warning is that a rush to transcos, especially those with traditional regulation, puts you right back in the position of monopoly regulation.

What about state regulators? Regulating distribution low-voltage systems within the state is not something the federal regulators want to do. I envision FERC being in charge of retail access or even distribution in the sense of establishing the right for someone else to send a bill to a customer. But there is a lot to be done in managing the retail market and encouraging restructuring.

We have to realize that the starting point in the transition is regulated markets, not unregulated markets. This means a lot when looking at these markets, especially, for example, in regard to mergers. We can run into conflicts because the merger guidelines assume some kind of competition before the fact. Bid caps are different from price caps in that if the market clears at above the bid cap, the generator would get that market price. We don't know exactly what we're looking for yet and are going to have to make it up as we go along.

It is important that we focus on and take a lot of care in terms of establish
information. I would prefer to have actual prices and quantities reported. The trade press reporting systems don't tell you exactly what information you're getting, and you can find all kinds of variation in the prices. In a pool context, this information is available. You don't have to know who is transacting at these prices, but you want to know what the prices are and how much was done at these various prices—"what if" information.

We are conducting, or can conduct after the fact, simulations of what would have happened if we had done something else. For example, if an ISO has one type of pricing scheme for congestion or ancillary services, you can often go back with the information it had and reconstruct a different market scenario with different rules and see which would have been better, giving you information about how to redesign the systems. In a lot of these ancillary services markets, we are starting from a blank sheet of paper, though we know that ancillary services are a lot more prone to market power than the energy market itself.

On market surveillance, again, looking at bids above marginal opportunity cost is fraught with problems. There can be problems with the accounting system, for example. Confidentiality is a real issue with information, although this may be a timing issue rather than an all-or-nothing issue.

On cost of service rate of return, the conservative approach assumes you can create property and call it a day.

The liberal approach has central markets without choice, which a lot of the power pools had already. We now have managed competition, where we give the markets designs but give the choice of going elsewhere. That is a good general proposition because people leaving the pool tells you something.

Question: Do existing laws permit FERC to monitor markets adequately, or will this require new legislation?

Response: When we look carefully, we can find the authority. We have broad authority to collect all kinds of information. We have enough authority to cobble together almost any of these regulatory programs, with the possible exception of wide- scale divestiture, though even in the divestiture area we could condition stranded cost recovery on some kind of a divestiture strategy.

Speaker Two

I would like to talk first about the things that can go wrong in restructuring. First is short-run market inefficiencies. One potential source of inefficiencies has to do with the basic design of market institutions and rules. As an example, California spent a year designing a complicated system for its power exchange and ISO, iterative bidding, day-ahead markets, and numerous daily and hour ahead markets for ancillary services. Then it turned out that software to make it work couldn't be written, so competition is going to start without a lot of the functionality that was designed. It is widely expected that the absence of many of these market features will lead to inefficiencies. These are not market power inefficiencies, but institutionally designed inefficiencies.

An important issue is the management of transmission congestion. In June, the PJM system operator identified a number of contingencies leading low-cost generators to be backed off when high-cost generators were being run because of the methods that were invoked to deal with scarce transmission capacity.

Reliability problems can emerge. The structure of ISOs has been heavily focused on, but my reading of PJM filings suggests that system operators were concerned they were going to lose control of the system. That is obviously an inefficiency of concern.

Another issue is the rationing of scarce generating capacity. To induce generating capacity investments that have anything like the levels of reserve margins that we have today requires some hours at very high prices, and any system that truncates the high price spikes is going to undermine investments in generation over the longer run and lead to inefficient utilization of existing generation in the short run. This is of concern because, first, there is an absence in most early markets of effective demand sides to the system, so that consumers cannot register their willingness to pay in the system and that rationing does not reflect that. Second, the introduction of price caps and bidding ceilings and

floors can under certain circumstances cap prices at times when they shouldn't be, and this can lead to inefficiencies in how scarce generation is rationed in the short run and affect investment decisions in the longer run.

Horizontal market power is a potentially serious issue. There has been too much emphasis on market power in broad regional markets and too little on localized market power problems—those that arise under certain system conditions when generators have to be run because they are at strategic locations on the network and in a position to charge very high prices. The challenge is going to be distinguishing market power from prices that are high for good economic reasons because of high demand scenarios. This requires a regulatory remedy.

Vertical market power problems are potentially real, although my sense is that they are going to be less significant than people think. In other countries and industries, especially natural gas, a lot of the concerns about common control have not been realized.

I see potential inefficiencies due to overregulation and taxation by regulation. In the latter, the deregulation process is used to put lots of goodies for people on the wires. If you look, for example, at the bill passed by the Massachusetts legislature, it is filled with regulations.

Finally, most jurisdictions have allowed utilities to recover stranded costs, and there are issues of how these costs are recovered so that they don't cause distortions in competitive markets. Regulators have to address this.

Ordinary consumers have not been very active in the discussion of deregulation. But there may be negative reactions and complaints from them. Some of these arise from problems in market design, but others arise because of the attributes of competitive electricity markets. If we are going to spot markets for electricity, there are going to be periods of time when prices are high, and the public reaction to this is going to be a problem. A lot of consumers are expecting to save a lot of money as a result of restructuring, but in many cases they won't. The savings that do occur will be allocated to some types of customers and not others. There may be a public reaction to that that raises questions about the efficacy of this initiative.

Finally, an especially knotty problem is consumer protection. We are introducing customer choice in Massachusetts, California, Rhode Island and other states all at once. Other countries, by contrast, have introduced it gradually, usually for larger customers first and then smaller customers. There are a host of problems associated with false and misleading advertising, and a consumer education program is important. There are going to be a lot of scam operators coming into the

market, and electricity is sufficiently confusing that there is an opportunity for significant ripoffs in the system.

A set of issues that will get attention very soon is metering, billing and settlements problems. The UK phased in their system, first applying it to customers who had hourly meters. We are not doing that here. There is going to be imprecision, arguments and problems associated with matching up what customers consumed, what their suppliers were obligated to supply, whether they supplied it at the right time and the right places in the right quantities.

The existing customer classes are imperfect, and there are going to be games associated with switching people out of particular classes because you can get them onto a high load factor profile. This may have unappealing income distribution effects. I suspect, for example, that it is going to be more economical for many suppliers to serve customers in Beverly Hills than in Compton, California.

Finally are bad debt problems. Sweden has had a lot of these--marketers that have gone out of business and haven't paid their bills, customers that have gone through seven different suppliers before someone caught up to them. Since we have rules in most of these systems where you can't cut anybody off, the incentives to move from supplier to supplier and build up bad debts are a potential problem. Regulators are going to get a lot of complaints about not getting paid.

What are we going to do about these problems? We should try to get it reasonably right to start with. Doing it fast and doing it right are not necessarily compatible. It is important to establish credible independent market surveillance units as part of the ISOs. These units should be focusing on significant inefficiencies, not just market power. A broad perspective is very important.

One of the challenges is to get data on prices and costs. There are inherent conflicts in the need of market surveillance units for data and the desire of market participants for confidentiality. A challenge for the ISOs and market surveillance units early on will be to resist the arguments that they should not be allowed to have very much data. They need it. They can keep it confidential, organize it so that the public does not identify particular buyers and sellers.

We are setting up slightly different systems across the country. The market surveillance units should be comparing notes and trying to understand what mechanisms work well and what don't. Checkpoints should be built into the process, and people should be prepared to fine-tune the system when performance problems come up.

One of the issues that is arising is, how much authority do we give to the ISO to fix the market? On the one hand, there is a subtext in many of FERC's orders of decentralizing regulation, shifting a lot of regulatory

responsibilities to the ISOs. On the other hand, there is a question of who regulates the ISO, what kinds of incentive mechanisms it is going to operate under, and how you keep it from becoming a monster. While I think the ISO can play an important role, I am reluctant to give it a blank check to fix what it thinks is wrong in the market.

Fine-tuning can be costly. If there are going to be major changes, regulators have to be prepared for people coming back with new stranded costs. If we are going to make major changes in the rules over time, we create a new set of interest groups who will be resistant to change but argue that they should be paid off if the rules are changed.

If we don't fix the short-run inefficiency problems, there will be long-run costs. You can create incentives for too much capacity to enter the market. One of the major tasks should be to make demand-side bidding operate effectively in a real time market. It has long-run investment incentives and useful market power mitigation incentives. Poor locational decisions regarding generating capacity investments has long-run costs. The price cap is a terrible mechanism for dealing with product quality. This is an area where we could get bad incentives in the long run for investment in exactly those sectors which we are continuing to regulate and which are the platforms on which competition has to take place.

We should encourage overinvestment in transmission. A competitive generation market is easier to operate if there isn't a lot of transmission congestion. I am concerned that we are not paying enough attention to helping to deploy technologies that will be widely available to allow real-time pricing. It is going to be a technology with substantial scale economies, and there is a question as to whether we wait for this to emerge in the market and the inevitable war of attrition that will result between technologies or whether we take a more proactive stance at trying to get a technology deployed quickly that brings a lot of people into the system.

Speaker Three

We hear a lot about the so-called regulatory contract. There is also a deregulatory bargain that we ought to acknowledge. Restructuring should result in several benefits for consumers, or it will not have been worth it. These include a more efficient transmission system, a fully competitive generation market, efficient regulation and a rational retail market.

How might we fail consumers? We may set our sights too low, compromising the goal of a more efficient transmission system, giving up on the question of horizontal market power in generation, failing to take this opportunity to make residual regulation more efficient. Failing by striking the wrong balance between consumer protection and the development of markets goes to the

question of whether regulators let go of the right things.

I have a graph that has two dimensions--difficulty of detecting error and risk of error. There is a risk that we will get it wrong on the competitiveness of the generation market, the efficient design and pricing of the transmission system designed to serve a competitive generation market, and the residual regulation of wires. But there is also a corresponding difficulty in detecting what the error is. If we move to a price cap-style regulation, it will be difficult to decide how it is going, in part because we have left behind the moorings of cost. However, the risk is somewhat lower with residual regulation of the wires.

With generation competitiveness, there is a fairly high risk that if we neglect horizontal market power, that could cut considerably into the benefits of restructuring. Getting transmission wrong poses a similar and slightly higher degree of risk. It will be a lot more difficult to detect and measure the error of the transmission inefficiencies than the error and risk associated with generation competitiveness.

Transmission efficiency is a complex problem, a regional dynamic that changes minute by minute. There are high data needs associated with measuring the success and design of transmission pricing. There are divergent trends in ISO structures and in pricing structures for transmission.

The challenges in generation include the fact that the market structure seems likely to continue its evolution. There are incentives for previously integrated utilities both to maintain that integration and to divest. There are also high data needs in judging the success of our efforts to create a competitive generation market, although there is the advantage of greater ability to make regional comparisons in terms of spot prices. In the long run and probably in the medium run, many of the differences in transmission between regions will not impact the generation markets in the same way, perhaps allowing us to make regional comparisons. And the history, the production cost modeling, the simulations for generation are somewhat richer and more relevant to the new market than the case is in transmission.

We should undertake price cap regulation of the residual wires business, with caveats and conditions attached. Price caps have a rich history in other industries—telecommunications, for example—and in some other countries. The ability to measure success is dependent in part on this because with price caps, as compared to setting loose the market forces in generation, the design is controlled by regulators to a much larger degree. We need to keep in mind the importance of quality service measures in evaluating the success of price caps. Under a price cap regime where prices are deflated by some measure of inflation, it is possible to get real rate reductions.

The success of restructuring is going to be driven in large part by consumer and political acceptance. You don't have to look much further than the Telecommunications Act of 1996 to see that. Consumer protection may be set against market development. I am working on the restructuring of the natural gas end-user markets in Georgia. A clear tension has developed before the Georgia public service commission as to how high the threshold should be for the licensing and registration of new retail competitors. In order to get a system to work, you want marketers to show up. On the other hand, you have an obligation as a regulator to some front-end protections for consumers.

There are some things which federal and state regulators need to do jointly-- especially making sure we get data. Questions arise as to how horizontal market power will be detected and what to do about it. One mechanism is to ensure that state regulators cooperate regionally to measure and prosecute a solution. I suspect that federal legislation will determine where that jurisdiction is and what the remedies might be, but it is important that we have an institutional method for actually bringing the issue forward.

Post-restructuring, there should be price regulation of the wires, regional monitoring of generation market, and enhanced consumer information and complaint handling. Anti-trust scrutiny is at best a backstop. Regulators need to be able to intervene when substantial imperfections in these markets develop.

Will regulators let go of the right functions? My greatest concern is that too much attention will be given to consumer protection issues and too little to market structure issues. The difficulty is that the exigencies of the short-run complaints and short-run reappointments to the public utilities commissions conflict with that. The retooling and retraining of PUC staffs is a very significant issue in moving regulation towards its appropriate role.

If we don't get it right the first time, provisions must be made to improve the results over time. Post facto evaluations will require data. To allow an ISO to operate and not collect or report data at the front end would be a great error. We also need to recognize that some measures of success are going to be relative judgments; comparisons with cost of service regulation will be difficult.

Speaker Four

After restructuring, regulation must shrink. Some monitoring and enforcement functions of regulators will have to continue. One piece of the process is to come up with a new set of utility affiliate guidelines that will regulate how utilities interact with any affiliated company that may be participating in the new market. In California, there is an alternate decision that has not been decided yet that would ban utility affiliates from competing in the new market for two years; it would also say that utility affiliates cannot have a name or logo that resembles that of the utility.

There is the issue of consumer fraud and what remedial action to take when a problem is found.

We will have to figure out what to do with California's PUC, which has about an $80 million budget, and its energy commission. If we are going to keep these people on the payroll, we have to figure out what they will do in this new market. We have problems with civil servant rules and how to reduce staff.

In California, the idea is that there is going to be very little regulation over generation except for monitoring market power. There will be inefficient generators in the market; markets have winners and losers. One of the most contentious issues in California has to do with must-run generation. Coming up with the terms of the contracts to govern it is a tricky exercise and one that the ISO, the new owners and FERC have a stake in.

What are the transmission and distribution regulatory activities? Pricing will be an issue. There is a question of where the line gets drawn between distribution and transmission, but we have pretty much sorted that out in California. We are spending a lot of time on retailing activities. The California commission has decided that services such as metering, billing, credit and collection activities are competitive services. But how do you operationalize that? How do you have customers decide they want to buy a different kind of meter from a third-party supplier who may not have been in the business before, and how does the utility actually get the meter read data in order to bill for the T&D services? This is an area with a lot of implications, and will probably end up with a very complicated set of rules.

The enforcement provisions and the enforcement function of the regulators will be important in this area. In California, for a service that a customer chooses to take from a utility distribution company, the utility has to rebate to the customer or to the energy service provider the cost which the utility avoids by not reading the meter. Figuring out the avoided cost and the credit is like having a small rate case. There is contention because the energy service providers want a high avoided cost and the utility wants a cost that approaches its actual avoided cost on a specific customer basis.

Since November 1 in California, energy service providers have been able to solicit business from new customers, and there are a number of direct mail programs and other advertising. During the early period of deregulation in California, consumer fraud is going to be a nightmare. There are multi-level marketing schemes being advertised on the Internet where you can sign up to be an energy service provider, and there is no oversight. Everybody's getting direct mailers about green power and different pricing schemes. There is a redlining issue in which some suppliers who are sending direct mail advertising to poorer service territory areas are offering special deals with different credit requirements than for wealthier areas.

Information and data will be needed to evaluate how the markets are working. The problem will not be the amount of data available, but how you interpret the data and what it means. I fear that we will end up having big hearings about what the data means in order to adjust the market structure one way or another. Prices are going to be high sometimes, not because there is market power, but because that is the way a market works. There are going to be some customers who lose. Regulators like to think that they can prejudge who will be the winners, and we have to be wary of that. There is going to be a tension between making the right data available in order to evaluate how the market is working and the confidentiality requirements associated with a competitive market, both customer data as well as generator data.

Discussion

Question: What data should be available? The WEPEX [Western Power Exchange] order requires a lot of reports to be filed, some having to do with changing the rules and recalculating what the dispatch would have been. But how do you deal with the problem in this "what if" calculation world where you do not have confidence that the market is going to behave in the same way if you change the rules?

Response: I wouldn't want too much analysis, resulting in made-up answers. There is enough information that the ISO could get some interesting answers with very simple calculations.

Response: Regulators will have to not overconstrain the system so that we get useful, real market data. You can only squeeze so much information out of the data. It is possible that the natural experiment set up because of the rules doesn't provide the information you want, and we will have to take that into account when we analyze it.

Question: Who should have responsibility for monitoring market performance? What criteria should be used to invoke action? Are there dangers in reacting too quickly?

Response: The ISO is the natural entity to collect and evaluate the information. There will almost inevitably be a break-in period for all of these markets. I would caution against reacting too quickly to things that don't look quite right. I would also caution against the view that there will be market power police who try to stamp out every deviation of price from marginal cost. We have to accept that there will be market imperfections.

Response: We have allowed the bulk power gas market to operate without any kind of ceilings or serious regulation, and we have seen some high prices. Once customers get $40 bills, they may complain to their elected representatives and to regulators, and there may be a response in terms of finding a way to shave the peak.

Response: I agree the ISO is the natural place for the data to be collected, but not necessarily analyzed. It may make sense at the beginning for FERC and the states to be very specific about what is to be collected and how it is to be reported and made available. The sustained departure of prices, rather than brief periods of consumers more, may bring in the regulators.

Response: In California, participants in the market who think they are getting disadvantaged will hire consultants and lawyers to interpret the data so as to change the rules in their favor. I agree that it would be wise to let things shake out for a few years before we start making wholesale changes to the rules.

Response: I am not concerned about these challenges being brought too early. It is important to set up institutional structures that permit people to bring challenges.

Question: An ISO has no financial responsibility for its actions if it is a nonprofit. So is the preference that ISOs become profitmaking entities? Should they start owning transmission assets as opposed to just operating of the transmission assets?

Response: The way we are moving to set up ISOs is probably the most sensible way to do it. Trying to create transcos in a short period of time is not feasible. There has to be some governance structure that provides a clear set of ground rules and performance criteria for ISOs to follow and some type of managerial incentive for the ISO management to adhere to those criteria. Creating a for-profit ISO with assets creates a new set of potential regulatory problems that we are not close to solving.

Comment: Nonprofit ISOs can last for a fairly lengthy transition period, but our ultimate goal should be a for-profit ISO that owns transmission and is much larger than the organizations we are creating now, with regional reliability councils and the regional transcos that are system operators merged into one body.

Question: Currently, individual utilities compete to provide transmission service. Sometimes they must reduce their rates. As we end up with large regional ISOs, will there still be competition in the provision of wholesale transmission service, at least as far as rates?

Response: We ought to recognize that some costs should not be in the hourly price, that the responsibility for some costs of the system should be carried elsewhere in access charges. So I view this as changing the way we price transmission, and then creating a financial or physical rights system with trading. This new kind of competition should be done in conjunction with changing the way we price transmission service.

Question: Am I correct that what is being said is that consumers are going to achieve fewer savings than promised, encounter scams, fraud, multi-level marketing schemes, redlining, loss of consumer protections and diminished quality of service, that there will be high accounting profits to utilities that will probably not flow through to consumers, that they will have increased consumer complaints, more consumer protection problems, the potential for improper allocation and poor distribution of savings between customer classes, that the losers for the foreseeable future will be consumers?

Response: In California, there is the guarantee that residential and small commercial rates will go down 10% and won't go up for four years. Response: It has been a big mistake to open the system up immediately to very small customers. We should have followed what other countries have done--start with the wholesale market, work out the kinks, have a mechanism to use the market price indices to benchmark what residential customers get, allow time to get the systems in place and to educate people.

Response: The analogy to look at is natural gas. It is understood that most of the benefits of unbundling flow to the large users who got off the local distribution system early.

Question: Do you foresee ISOs or FERC establishing a set of rules about what data remains confidential and under what circumstances?

Response: I hope we can come up with confidentiality rules that are routinely used in other areas that don't require the world to have access to everybody's data. The Federal Trade Commission and the Justice Department regularly do investigations using confidential business information. We may have to get away from the tradition in electricity regulation of excessive due process.

Comment: I see problems with the decision to relieve transmission constraints, because there are economic interests of market participants on both sides which makes it difficult to use the traditional seal mechanisms, yet the data is clearly relevant.

Response: In order to relieve transmission constraints, the information you need is on market clearing prices and how they vary. You don't need to know the generator's costs or what every generator is bid at a particular point in time. Those kinds of decisions can be made with data that I think parties would have difficulty arguing is necessary to be confidential for business reasons.

Question: What kind of incentives will encourage new generators to come onto a low-cost system where most of the existing generation is depreciated?

Response: Until you establish a set of rules that are reasonably permanent and which people can plan on, you're going to have difficulty attracting new investment. In Alberta, there is no mechanism to make investments because the spot market is subject to change. There are price caps, so prices can't go above a certain amount. So there is no market mechanism to attract new investment.

Question: What kind of benchmarks can be used to define whether competition exists or not?

Response: We are rich in information. There is a lot of cost data on the existing generators. But benchmarking may be important for the load pockets and ancillary services we will be dealing with in the future. We haven't started thinking about these issues very well yet. For example, we don't compare the performances of the different control area operators.

Response: That is the place to start, because you can't figure out what data you want to collect until you know what you're looking for. As long as the focus is on finding big problems, not on 5% deviations of price or marginal cost, you can get a sense for how well the market is performing by thinking through how an entity with market power would behave, then looking for that kind of behavior in the data.

Question: Isn’t there also harm in trying to project what the market will look like and making corrections that may cause harm?

Response: One has to be reasonable. Sometimes you have to wait, collect the data and see if there is a problem, and then try to fix it.

Speaker One

In the initial stages of transition, the regulator's role will be a very active one in terms of deciding to what degree divestiture of assets is going to be required, about control of ISOs, making calls about market power issues. They will have to define the standards by which market power will be measured and what kind of information needs to be reported to the regulatory agency.

The operating assumption should be that the information they acquire becomes public information absent some compelling reason to the contrary. FERC has taken a stab at this in its WEPEX order, Appendix C, asking for information to be provided either on a regular basis or by specific dates. Making the information publicly available allows anyone to obtain information on what is happening in the marketplace and perform their own analysis.

A component of that is continuing review over mergers and acquisitions, and the different types of business activities involved in the mergers. A utility merger can be seen not as a single merger, but rather as a series of mergers between different lines of business activities that the utilities are engaged in, and market power in each area should be looked at.

How will we adjudicate in terms of the fact that there is a powerful incumbent with an enormous head start? One simple answer is to use anti-trust litigation, by private litigants, the state attorney general or the U.S. Department of Justice, perhaps the Federal Trade Commission or Federal Communications Commission. But this is incredibly expensive and time-consuming, and not necessarily the most effective way of quickly developing policy. The regulators in electricity, both at the federal and state levels, need to have considerable expertise in the anti-trust area. They are currently very lacking in this.

The other area is retail market management: How are we going to price the residual monopoly services? The idea that price cap regulation gets imposed and the regulators can go home because the price cap is self-fulfilling is bizarre. These price caps are never permanent; they're dynamic. We can see the problems with price cap in England. So pricing the residual service, and making sure to get the appropriate balance between the investors and consumers, is an important function of regulators at the retail level, the transmission level, and the residual monopoly level.

Transmission, unlike distribution, is far more complicated. It is hard to conceive of a price cap working in any effective way in the transmission market. Price caps are an incentive for reducing costs. They are not an incentive for increasing productivity, and it is the job of the regulator to make sure that the cost reduction doesn't result in a diminution in the quality of service. In the telephone area, U.S. West, Ameritech, and others used this as an excuse to stop providing quality service.

Handling consumer complaints effectively is one of the most important functions the regulator can do. Now it will become a central part of the police function of the regulatory agency.

Stranded benefits issues--low-income programs, economic development programs, perhaps R&D, promoting favored technologies like renewables—are ultimately going to end up in the regulatory arena. No one believes that these issues are going to be resolved by the legislature. How they are dealt with is critical because of the social expectations that have been built up and will continue. No electrical system in the world was created for the sole goal of economic efficiency.

The relationship between the voluntary and the de jure regulatory regimes will have to be sorted out, relating to the fact that regional markets are evolving. State regulators have discovered that electricity markets do not stop at state boundaries. And FERC cannot possibly monitor all the regions in the country in an effective way. The development of regional institutions is critical. The de jure regulatory regime needs to have some coincidence of circumstances with the market regime that is emerging.

Telecommunications provides lessons for what regulators need to look at. The FCC decided that inside wiring was a competitive service and ought to be deregulated. The theory was that anyone could come into that market, but nobody has successfully competed with a local exchange company. So in terms of when to let go, there needs to be some evidence that in fact there is a viable market, that entrance is not just theoretically possible but is in fact possible, and that the potential for abuse by the incumbent network operator has been sufficiently curbed.

What handicaps for incumbents ought there to be? What sort of barriers for new entrants need to be removed? This sort of analysis needs to be done before you let go. The opportunity for scams in electricity is infinitely greater than in the telephone business. Somebody will have to license new entrants.

Speaker Two

The goal of the market is that it should operate efficiently, which includes least-cost dispatch of electricity and appropriate incentives for investment in both generation and transmission, both the quantity and the location. But it will be difficult to achieve these goals in the hybrid system we seem to be developing.

Regulators should look for market power. They should try to set up efficient institutions, and need to look for the strategic use of regulation. There is increasing evidence that market power in generation is a problem that is overrated by regulators. A dissertation just completed at the University of Arizona by Michael Denton looked at the price data for the western grid over the last couple of years and did a geographic market analysis. His conclusion is that the wholesale electricity markets are much bigger than is frequently thought. Prices all over the western grid are closely related to each other, and distant power is a substitute for local power. His analysis shows that the western grid is divided into two geographic markets, and that, at least for the markets he has studied, none of the agents in the existing electric wholesale markets have any significant market power because the western grid is well integrated to the extent that the markets are large and the resulting concentrations are low.

The regulatory approach should be a presumption should be that wholesale electricity markets are competitive, and it should be the burden of the regulator to show that they're not if the regulator wants to intervene. Once there is competition, one could do a study testing the hypothesis about whether there is market power or whether there is a relationship between prices or price cost margins and the concentrations in the markets. Then if the results show market power, there is at least a basis for intervening.

The pricing issues of transmission are proving difficult to resolve. Regulators should look for whether markets are clearing. I saw a presentation on the POEMS (Policy Office Electricity Modeling System) model, which estimates the effects of competition on a variety of things. It assumed zonal rates for transmission, and it turned out that with zonal rates, the transmission markets often don't clear; there is often

excess demand at various interfaces. You also want to look at the investment incentives of the transmission pricing system.

Market institutions matter in a way that may not always be obvious. A different study at the University of Arizona tested the sealed bid offer system versus a uniform price double auction system. The sealed bid offer system is one in which you put in your bid and offers for different quantities and the market will clear, but you don't have an opportunity to revise your bids. The uniform price double auction allows you to revise your bids, and is an iterative process until the market is called. The sealed bid offer system, essentially a one-shot system, was better at revealing the true preferences of the market participants, because they were afraid if they behaved strategically there could be big penalties. With an iterative process, there was more of a tendency to try to behave strategically.

The strategic use of the regulatory process is a big problem. The most important thing is that the market should be neutral. Historically, the major inefficiencies in the electricity market are attributable not to competition, but to the regulatory system. We have inherited an expensive and inefficient capital stock, prices are too high, the price structure is not efficient, we have Balkanized markets—these are the products of a regulatory system, and the challenge as we move into this new world is to avoid the problems of the past without creating new ones that are equal or greater.

Speaker Three

I will confine my remarks to wholesale.

Economists can generally agree that the primary indicator of the adequacy of competition will be a comparison of post-restructuring prices and calculated competitive prices. Calculating hypothetical competitive prices is not a trivial task, but it is doable, provided we have an institution like California's Power Exchange for making spot-market prices. Then there will be market-clearing prices established that are observable. If we can conclude that the spot markets are competitive, we don't have much to fear about bilateral transactions or any kind of long-term trades made in these markets.

Economic theory teaches that the competitive price is the short-run marginal cost. This means that each generator will be paid the short-run marginal cost of the highest-cost unit necessary to satisfy demand. The units that are paid higher than their own short-run marginal cost earn scarcity rents. These rents can be very high, and I expect that they will be at times. They help to attract capital to the system.

We calculate these hypothetical competitive prices in a model. If we think about transmission as a highway system, or a switch network, then it is fairly easy to calculate an equilibrium

assuming that all units are bid into the market at their marginal cost. That will give us the competitive equilibrium, and we have something to compare.

I wouldn't worry about whether we get marginal cost exactly right. The study by Severin Bornstein and James Bushnell of California's deregulated markets makes the simplifying assumptions on transmission. What we don't know yet is whether they missed something important in making these simplifications. We will have to do some work that takes into account the complexities of transmission networks. The transmission models needed for this purpose already exist.

What about market power? Defined the conventional way--a downward-sloping demand curve--you certainly are talking about some of the electric power industry. But that shouldn't overly concern regulators. There needs to be some excess of prices over short-run marginal costs to provide the revenue to pay the fixed costs. To the extent that those revenues are only paying fixed costs, they are termed "quasi-rents". The existence of this quasi-rent is not a market power concern.

"Monopoly rent" is the excess of prices over long-run marginal costs, which includes the fixed costs. Monopoly power refers to the ability profitably to price in excess of long-run marginal cost. Defined in this way, it's monopoly power we're looking for, not market power. We would calculate monopoly rents after observing the market in much the same way we calculate stranded costs. The difference is that when you calculate monopoly rents and separate them from quasi-rents, you want to look at the cost of new generating capacity that might enter the market, whereas with stranded costs, we are looking at the historic costs of the units that are already there. It is possible in theory to have both stranded costs and monopoly power at the same time. I emphasize that the existence of some monopoly rents is not itself enough to justify any intervention in the market.

Regulation is costly, particularly the indirect costs from the inflexibilities and pricing distortions. There are probably massive inefficiencies in the electric power industry from not having marginal cost-based time of use rates--many billions of dollars per year. A little market power is a small price to pay. In most of the economy there is a strong presumption that we don't intervene. Anti-trust is not an exception. It is not against the law to have monopoly power.

One possible source of problems is that there are fundamental flaws in the market institutions themselves. It may be hard to set up a market that cannot be gamed. This has to be looked at, and the current regulatory commission should have that responsibility. A different problem is collusion. The lesson in this for electric power restructuring is that the disclosure of bid information to market participants is a serious competitive issue. The appropriate thing may be to allow the information to be obtained by some individuals and not others, or to allow

anyone to have it, but with a significant lag.

There are probably little pockets of market power because of transmission constraints. That also is something the regulators should be looking at, and I'm not sure that they have the authority to order the transmission upgrades that might be needed. One thing that can be done is to condition market-based pricing on transmission upgrades, and the states might be wise to use the carrot and stick approach. Otherwise, the solution may be divestiture. There is no remedy under anti-trust law. Legislators should include in legislation a provision for divestiture under specified conditions when certain findings are made.

The anti-trust laws prohibit cartel behavior. If elected power producers engage in explicit collusion and get caught at it, they will be prosecuted. Last fiscal year, fines and criminal anti-trust cases totalled over $200,000,000.

However, the precise reach of the anti-trust laws with respect to collusion is not so easy to state. The Supreme Court says that what violates the anti-trust laws is "a unity of purpose or a common design and understanding or a meeting of the minds in an unlawful arrangement". That is not entirely operational, and the law has not entirely come to grips with modern game theory. A lot of what economists call collusion could not be prosecuted successfully even if they are illegal. Various agreements that are not collusion but that frustrate competition are subject to the anti-trust laws.

Anti-trust enforcement includes acquisitions and mergers. They are unlawful when the effect "may be substantially to lessen competition". In recent years, we have investigated a number of electricity mergers that have not gone through, and had they not been stopped in the regulatory process, might possibly have been the subject of lawsuits by the Anti-trust Division.

The Anti-trust division sees as one of its missions competition advocacy, meaning that we advocate free market and efficient solutions to the allocation of resources. This has commonly meant that we've advocated changes in market institutions that are anti-competitive, and the Anti-trust Division is likely to play a significant role in competition advocacy in electric power in the next few years.

Speaker Four

Rather than regulators playing less of a role, they should in the future play a more focused role, looking at where regulation is needed to make competition work. What we really want to address is the indirect cost of regulation—its inefficiencies, deterrence of innovation, encouragement of litigation, creation of an environment of uncertainty.

Traditional regulatory responsibilities include general rate cases, IRP reviews, approval of bulk power purchase and off-tariff sales contracts.

Consumers will now enter into these contracts more directly with a competitive seller. Also, review of utility energy efficiency plans, quarterly fuel charges, and corporate financing.

For the next several years, there will be a great deal of activity in states all over the country as regulators and legislators develop comprehensive plans to transition this industry. One of the keys to achieving a competitive environment is developing codes of conduct to govern the relationship of utility marketing affiliates to the regulated utility distribution entity.

As to the challenge of how regulators will respond to the restructuring of this industry, I think not so much in terms of functions as in terms of criteria for a competitive market. The ideal conditions for competition are many buyers and sellers having access to the market, broad access to high-quality information, and a uniform fungible product. As to ensuring that there are many sellers in the marketplace, there remains work to be done at the state level. There are still many state plant siting laws that take a fairly restrictive approach to siting new sources of generations. Administrative showings of need have been a source of litigation for neighbors.

Supplier licensure is a critical area for regulators. We need to provide sufficient consumer protection so that there is not widespread fraud, yet ensure that the market is sufficiently open. Over time, the controlling factor is that the entities that want to stay in this business understand that their most important asset is their reputation, and if they fail to deliver consistently on their commitments, customers will migrate to more reputable suppliers. But we don't want to wait until a lot of problems develop. That is a delicate balancing act which every state commission and legislature will have to wrestle with.

I agree that it is a mistake to open the market for all customer classes at once, because we don't have the systems in place. A standard service provision as a backstop will be necessary since many customers don't know what's going on.

Buyers and sellers should be pricetakers and pricemakers. Regulatory commissions will need a much more sophisticated analytical capability--fewer accountants and more economists, an ability to review mergers and acquisitions with an eye to anti-trust guidelines. We need to avoid mergers and acquisitions that could give rise to significant anti-trust problems. I don't believe anti-trust law represents a practical remedy; it is too lengthy and expensive.

We will need a greater sensitivity to the possibility that generators are going to game the system. We have to be sensitive to regional differences in the ability to exercise market power. But we have to be willing to tolerate that market participants are going to behave differently in a competitive market from the way they did in a regulated market. As more and more participants pursue behavior that is in

their economic interest, ideally they will arbitrage away those rents. But if the rules are wrong, there will be an opportunity for that kind of behavior to persist.

In the gas industry, there is a topology of prices that varies from point to point and time to time. We won't have a really competitive market in electricity until we have a topology of electricity prices. But the prices are likely to vary much more frequently; they will be cyclical on a daily basis as well as a seasonal basis, and are likely to change much more rapidly as individual units are taken up and down.

A final point is the need for a fungible product, ensuring that the customers get what they contract for. I think the issue of power quality will come more and more to the forefront for electric distribution companies. The quality and reliability of power on the grid is high, but the demand for high quality power continues to escalate as we become more reliant on high technology and computers that cannot afford to be without power even instantaneously. So there is a critical role for regulators in ensuring that services are provided at an acceptable cost but without deterioration in quality and hopefully even with improvement in quality.

No matter how well we plan for this transition, there will be some bumps along the road, and we have to have tolerance for those. After the gas market was deregulated, there was significant volatility, which over time dampened out. We have seen the same pattern in electricity markets in other parts of the world, specifically South America and Scandinavia. Over time, if customers are exposed to that price volatility, they respond, making investments in energy efficiency and peak clipping types of equipment. Their demand-side actions work together with the marketplace to produce a system with lower costs and a higher level of reliability. In a five- to ten-year time frame, I'm optimistic that there will be tremendous benefits.

Discussion

Question: How will we avoid an expectation that regulators will now be regulating oligopolies?

Response: There will be a different mission for state regulators. They will not be setting prices, but will be making sure that the structure is there so that the prices set are reasonably competitive. If the institutions evolve in the right ways, there should not be the need for a lot of cops on the beat.

Comment: The ISO may be a solution, but if there is concentrated economic power in the market, the ISO will be as much a victim of that power as anybody else.

Response: The ISO is intended to address the vertical control issue. Whether it does a good job remains to be seen. The ISO does not speak to the market structure in terms of concentration. It may be appropriate in some cases for states and the federal government to deal with that by requiring divestiture.

Question: A competitive price may for some period of time be above what we would have traditionally used as the calculation of long-run marginal cost. What does this suggest about what patterns of observations regulators should see before they begin to intervene by going beyond removing barriers to entry or other inefficiencies?

Response: Policymakers will have to make this call, looking at costs and benefits. To the extent that some of these remedies for market powers are relatively low-cost, there may be reason to engage in them.

Response: One response is to do nothing. If you decide there is a systemic problem, there is the traditional anti-trust response of doing something to make the market more competitive or enjoining particular practices. This is oriented towards structure or specific kinds of behavior. A third response is to reimpose the regulatory regime. Legislators dealing with restructuring will have to contemplate what kind of reaction to those kinds of problems should be required and what evidentiary burden needs to be sustained before the regulators decide there is something other than the marketplace at work.

Response: I am more pessimistic about relying on behavioral safeguards and sanctions than on structural remedies. In New England, there is a preference for utilities divesting of at least their non-nuclear generation. Although there will be costs in mandating some of the corporate restructuring and divestiture, the judgement in New England is that that is a cost worth incurring in order to reduce the risks of these kinds of behaviors.

Question: How does the regulator know what is going on? In some countries, regulators sit in on ISO meetings. In the U.S. it has been said that that could raise the argument of an ex parte communication.

Response: For regulators to be effective in the new world, we need to have process reform. There is an increasing importance of relying on complainants to bring these issues before the regulators. The idea that the regulator is a dispassionate, neutral observer is bizarre in the current world.

Question: What would be the position of a citizen who has an electrical problem, but switched distribution companies last week?

Response: This goes to my pessimism about behavioral safeguards, because there is a real risk that there could be some preference for serving one's own or affiliate's customers.

Question: Does a state have a right to enact rules that make it difficult for out-of-state suppliers to enter the in-state market?

Response: Ultimately, electricity is a commodity in interstate commerce. If a state puts up a barricade to keep out-of-state power out, that will be struck down.

Response: Things will flow in the other direction. The states with open markets will tend to attract power from other states. As neighboring states sell power into the open market states, the problem is going to be for the consumers of the state that does not have open access. Their customers may find that they are being saddled with the high fixed cost of the utilities so that it can sell low-cost, discounted power into the open access states.

Question: We know in principle how to calculate these market prices using models. Yet around the country, simplifying assumptions are being made in order to produce numbers to be used for prices. At some point, system operators need to look at the real situation and constraints. In terms of the data that should be made available, should the system operators or others do this calculation and make the information available, or will we rely on these simplified approximations which obfuscate a lot of problems and make it hard for anyone to analyze what is really happening?

Response: The system operator should do these computations and publish the results. I am not keen on making the simplifying assumptions until there is some evidence that they don't matter.

Question: Prices have to rise above marginal cost in order for fixed costs to be recouped. Yet you are talking about the need for regulators to design market structures. How involved do regulators need to be in designing market structures?

Response: There are many ways to recover fixed costs, such as capacity payments. It is likely that new capacity will be brought into the market not just through spot market pricing, but also through long-term contracts.

Response: Another factor that will come into play in the long run is prices not set just on the basis of the marginal costs of the units that are operating. When we really have demand-side bidding, if shortage is developed and customers are effectively bidding to get off the system, then we get a more efficient market. At least in New England during the next few years, we are going to have this multi-part market in place.

Comment: I would like to see a study of the transactions that didn't occur, of where barriers were encountered when trying to do business.

Question: Are you saying that as a result of order 888, transmission markets have become less active than previously?

Response: No, I am saying that we have made strides forward. There are probably many more transactions taking place than in the past. But there is non-compliance with requirements to post the available transmission capacity and the price.

Question: Does FERC have live transaction data that would indicate the impact of 888?

Response: FERC collects data from pre-Order 888. It is available for use, but is not being analyzed now.

Comment: My company's experience since order 888 is that we can now get through to a large utility nearby. We can now buy much more for own use. It has really helped us.

Comment: It is a challenge to get this done because if we don't begin to get this information reported, it will be very hard to get it later.