HARVARD UNIVERSITY

JOHN F. KENNEDY SCHOOL OF GOVERNMENT

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HARVARD ELECTRICITY POLICY GROUP
FIFTH PLENARY SESSION

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MEETING SUMMARY

The months prior to this meeting witnessed rapid development in the debate on issues involving market structure, as well as the role that different institutions will play in this major policy transition. The HEPG continues to focus on the challenges of the transition, investigating alternatives for regulation and structure. This session explored emerging models for industry restructuring, concommittant changes to regulatory practice, and the possibilities that the future industry presents.

This summary necessarily abbreviates the presentations and discussion at these sessions. A list of materials that were circulated at the meeting is included for further reference.

Thursday, October 27

Wholesale Power Markets: Problems & Solutions

Competition in wholesale electricity markets has been accelerated by the EPAct regulatory initiatives, and the focus of the market. An evaluation of the progress and problems of these markets can provide a background for expanding the policy discussion and developing solutions.

PROBLEMS

First Speaker:

Independent power suppliers must sell power into a market where their customers are also their competitors. This dual utility role often results in a playing field that is anything but level. In the absence of a truly competitive market with arms-length transactions, we will not be economically efficient industry.

Utilities are held to a different performance standard in terms of accountability. Independents must often meet strict project milestones and post insurance or a security escrow. By contrast, if a utility project is late, the utility does not face the same risk of cancellation or penalty. Likewise, utilities are not held to the same economic standard -- when a utility claims that

purchased power costs are the reason for high rates, they are subjecting these contracts to an after-the fact review of performance that they would resist for their own plants. Utilities also participate in bids expecting that regulators will
wipermit price adjustments in order to ensure the financial integrity of the utility and therefore protect the ratepayer. The truth is, however, that this doesn't protect the ratepayer -- it sticks them with the higher costs.

Barriers to competition in the generation market consist of:•

- ***Legal and regulatory barriers ¡o entry***
- ***Pricing discrimination***
- ***Anti-competitive utility behavior***

A competitive market requires symmetrical treatment of risk. Th current patchwork of regulatory reforms will not produce this kind of market. Utilities have a much greater ability to influence need determinations because they have greater access to the information that is used in the process of determining the need for new capacity and for calculating avoided cost. This can lower their risks significantly relative to competitors.

They also enjoy a competitive advantage from their greater access to ratepayer-funded resources such as land and lower financing costs. These cost differences come from the utilities' legal status, rather than from a relative economic advantage. This, too, leads to economic inefficiencies which cost the ratepayers money.

In order to move the industry toward a competitive market framework, two courses of action must be pursued simultaneously. The first is structural change -- ownership of generation should be made separate from ownership of transmission and distribution. Separating ownership is the most straightforward means of addressing the defects in the current generation market. Obviously, utilities will need to see the sale of their generating assets as a financially attractive prospect, and we need to begin to develop proposals for working **through** this process in the most equitable and efficient fashion.

The second strategy is the redefinition of the purpose of regulators to include the achievement of a competitive generating sector. Regulators can begin to make changes immediately, by subjecting utilities to the same standards of accountability and economic performance that they demand from independent producers. Identical requirements with regard to bidding practices in competitive procurement processes and a shift to performance-based ratemaking would do much to improve the overall efficiency of the industry. Regulators can also take steps to make access to resources and information more equitable.

If we build institutions based on the premise that we have a fully competitive system already in place, they will fail. Without a competitive market structure, we cannot be sure that the push and pull of producers and consumers pursuing their own interests will produce an efficient outcome.

[Question: Are you pushing for an equivalent to Order 636 for the electric industry?]

The 211 process (granting transmission access for wholesale transactions) is time-consuming, and each filing must be structured differently. For the sake of operating efficiency, a blanket ruling would be preferable.

Second Speaker:

There are actually two competitive electricity markets developing today in the U.S. -- the market for generation, which the first speaker talked about, and the commodity market for the actual electrons themselves. This market, too, is having a hard time coexisting with a monopoly-based system. If we intend to have a competitive wholesale commodity market, the industry and its regulators are going to have to move fairly quickly from traditional economic regulation of the industry to the development and enforcement of fair trade practices. This is the role of regulators in an open commodity market. When the FERC allowed open access to transportation services in 1984, it took about three years to change the market mechanics and the regulatory environment -- starting in 1987, we saw a complete shift in transactions to a non-regulated market structure. This shift is happening much faster in electricity because there are huge discrepancies in prices between different areas, which creates a tremendous incentive to open up the system so we can trade electrons between these areas.

Power marketers were originally viewed with interested curiosity by the industry -- that attitude has changed quickly to one of active hostility, and utilities are doing a number of things to try to limit the ability of power marketers to operate on the national transmission grid. We saw a very similar phenomenon in the natural gas business when the monopoly providers of transportation services started having to deal with open market transactions. A power marketer actually provides capital and takes title -making actual transactions in the market. Unlike a power *broker,* who buys and sells the same commodity and relies on market imperfections to make money, a power marketer repackages and restructures the commodity, producing new products.

One of these new products is the development of new supply pools on a continental basis. We know from portfolio theory that, the larger the scope of a pool of resources, the more risk diversification possibilities there are. In the gas business, we find tremendous opportunities to wheel gas from areas where the weather is warm to areas where it is cold that could never be acted on under the old regional structures. Our largest business is providing price risk stability through this sort of contract. It requires significant capital and a great deal of risk, and people who are good at managing that can make a margin.

We are now seeing a rush of financial institutions into the power marketing business. These new entrants will exert a great deal of pressure for mechanisms that will make it possible for them to do business on the national grid. Although market liquidity is still rather thin, this business is developing very rapidly, and there are several issues that need to be addressed quickly to allow it to take off.

The first issue is real access to transmission. The process of getting access is currently very cumbersome, and to the extent that utilities can deny that access, they do. To the extent that they provide access, they do not yet provide it on a comparable basis with their own access. Equal access to pricing and pool price data is also denied throughout the country. The power marketing business needs the equivalent of FERC Order 497, which prohibits regulated utilities from providing benefits to their unregulated *gas* marketing affiliates. In the absence of that sort of ruling, there is tremendous potential for abuse.

Utility market power is also a problem. We have negotiated a number of transactions that were subsequently taken away by utility

marketing entities because we had to file with them who we were purchasing from and what the routing was -- this is tantamount to giving your competitor all of your information.

Utilities have a number of ways of exercising their monopoly power to prevent access to the grid. One utility told us, "We'll transmit for you as long as you aren't talking to any of our customers." Power pools have used procedural mechanisms or foot-dragging to prevent transactions -- these delaying tactics particularly give them time to negotiate long-term contracts and lock in their customers so that they're off-limits when the grid finally does open.

At this stage in the development of the market, you expect this kind of behavior, but we have to work our way through to some fair trade practices. Utilities need to take a look at anti-trust laws and think about what sort of policies and procedures they might want to have in place in their control rooms and dispatch areas. All of our employees go to a seminar twice a year on fair trade practice issues.

The major regulatory hurdle is, of course, comparability of transmission service, but there are many other regulations that were clearly designed for another era. For example, having to specify capacity in a transaction is a rather archaic concept in the context of this type of power transaction. We will have to make some changes in this type of standard as the industry's structure changes.

Discussion:

Futures markets for power

: You cannot have a futures market until you have a settlements system. We saw explosive growth in the natural gas marketing business in 1986 and 1987, but the futures market for natural gas was not launched until 1990 -- you have to have a cash market in place that offers a reference price for that **forward contract. We don't have that today** with electricity. We don't have the information, we don't have the pricing, and we don't have the open markets that allow for a settlement system to emerge. It will take two or three years to develop that cash market -- then we can start to think about futures contracts.

Deintegration and comparability of service

: If you have comparability of service, there is no strategic advantage to forward integration for an electric utility. In the gas business, we found that it was a disadvantage, because any affiliate transaction was subjected to such scrutiny that you ended up contracting on less favorable terms with the affiliate just to survive the scrutiny that those contracts got.

Question: Short of de-integration, how can transmission owners be provided with the right incentives to provide efficient, comparable service?

_: It may just be a question of evolution -- you start to get a service mentality once the cold wind of competition starts blowing through your marketplace. I don't think you can do it from a regulatory standpoint, through incentive rate structures.

Loop flow

: Loop flows are nothing unique to the electricity industry -- every industry has imbalances, and you need to develop a balancing mechanism to settle those imbalances. We had to solve this problem in

the natural gas industry -- it was a big problem. We came up with imbalance clearing mechanisms and it doesn't affect the system at all.

: There are two problems being discussed here: there is the problem of equal access and comparable service (which include things like self-dealing) that we have addressed with the Energy Policy Act and are in the process of putting in place; and there is the problem of equity of resources between competitors -- does one company have better sites than another, or better people, or better tax laws -- this latter is a much murkier area. It is not quite so obvious that, when "Somebody else has an advantage that I don't have" it is a matter of public policy. The priority should be comparable access and changing the self-dealing incentives.

SOLUTIONS

First Speaker:

The model I'm going to describe starts with the assumption that a structural solution to the industry's problems is preferable to a regulatory solution. Consequently, we developed a restructuring approach in this model, and made a number of initial assumptions about what the essential parameters of such a restructuring might be.

We assume that there is value to be created by this restructuring -- that the objective in changing the industry is to realize net benefits from doing so, and therefore any plan should concentrate on creating value. Regulation brings with it a lack of incentive to cut costs. It has been our experience that independent power producers can build and operate power plants more cheaply. than utilities can. We hypothesize that there are operating cost savings to be had at most of the 800,000 MW of existing regulated utility-operated generating capacity. Any plan to realize value from the existing industry can start by selling off generation to create a structure which makes more efficient operation possible.

Elements of a restructuring plan:

- ***Realize net benefits***
- ***Provide for recovery of stranded assets***
- ***Immediate savings for ratepayers***

We have also assumed that any plan should provide for recovery of stranded investment, because the costs of *not* covering it, in terms of upheaval of the industry, are potentially very high.

Finally, we assume that any restructuring model must provide some immediate savings for the ratepayer, since that is the immediate driving force behind all of these changes to begin with.

The way we propose to accomplish all these things is to auction off generation assets at book value or above. Each plant would be sold with a contract which would cover a discounted combination of book value plus operations and maintenance plus fuel costs - a rate structure determined pretty much as it is now, but with, say a 5% discount, to give the ratepayers some savings up front. The shareholder gets at least book value, and the asset buyer gets something with which he believes he will at least be able to break even.

Stranded assets are better handled through contracts for generation than "on the wires", because it is much easier to sell a plant

that comes with a contract -- it provides more certainty of the value of the asset. And an auction for these assets is a good way of discovering their value -- when people are bidding against each other, they get very creative and aggressive about what they feel they can do with cost-cutting.

It would be necessary to keep the regulatory structure in place on the buyer's side for the period of the contracts, so this proposal would have a longer transition time than others. On the other hand, the magnitude of write-downs under *any* recovery scheme is going to dictate a long transition period. We have been seeing steadily declining prices over the past ten years, which will help alleviate some of this problem.

This plan, if implemented, would probably have to take place piecemeal, if only because of the magnitude of capital formation that would be needed to accomplish these asset transactions.

Finally, there are some plants that are so high-cost that this plan simply won't work. The only solution for these is simply to have the ratepayers pay for them and shut them down.

This model may need some modification, and an experiment would definitely be a good idea. We have had several utilities approach us about this already.

Second Speaker

Our group approached the issue of industry restructuring in a slightly different way. We decided that the necessary elements of where we wanted to end up were three: a competitive wholesale generation market for both new and existing generation; an open and efficiently priced transmission system; and a cleaner environment. This industry is going to continue to be driven economically by environmental concerns -- probably even more so in the future than it is now -- and these concerns must be an integral part of **any restructuring plan.**

Objectives of a restructuring plan:

- ***Competitive wholesale power market***
- ***Open and efficiently priced transmission system***
- ***Cleaner environment***

It will be impossible to strike a deal with everyone at once. Therefore, in terms of implementation, we felt that it was necessary to develop a plan that would work reasonably well for just a single utility -- and perhaps a little better if we did it for the state or the region overall. It would also have to fit within the existing regulatory framework -- no new institutions.

How do we propose to do all this? The key of this proposal is to sell transmission to an unaffiliated entity at a price which is roughly equal to embedded costs plus stranded costs. This is a price which will generally be well above book cost and well below replacement cost. The gain on the sale goes to the consumers in the form of written-down generating (or other) assets.

When the utility sells its transmission assets, it is still in the generation and retail distribution business. As a retail distributor, it pays some form of lease back or access fee that is sufficient to cover the premium paid for the transmission assets -- this exchange leaves the price of transmission unaffected by the fact that the assets were sold at a price that was well above book value, and stranded costs do not burden the wholesale market.

How the stranded cost responsibility is passed through to retail consumers is a matter which is entirely up to state regulators and the utilities, **as** it is now. The key thing is that it is charged through the wires, which clearly places it within retail jurisdiction. Transmission is also a better place to put these charges, because stranded cost isn't only in generation.

Under this plan, generation is written down and deregulation is phased in. You can lock in the benefits of this now cheap generation by signing long-term contracts based on market value, as a guard against prices going up. When a plant reaches the end of the contract, it is deregulated, which means that it is out there competing with all new generation (and it is subject to new source emissions review, so that the oldest and dirtiest plants will either clean up or shut down). We are still talking about what to do with the uncertain costs of nuclear plants, such as decommissioning and waste disposal.

Third Speaker:

About the time that gas was deregulated, the utility that I work for made a strategic decision to "go short" on electricity as well as on gas. That meant that we invested in transportation so we could get to the market, and stopped building power plants. We have gone to performance-based rates, and have supported customer choice because that's the way we think the industry is going to go.

Decisions that are consistent with an open access market have lead us to solutions which essentially involve disaggregation of the business. Unlike the previous two proposals, our proposal does not deal with these issues through divestiture of assets. Rather, it relinquishes *control* of the operation of those assets to achieve the same arms-length effect.

We believe that the best way to achieve this competitive open access market is through separating systems operation from generation decisions and giving it to a power pool. Such a pool would make independent dispatch decisions and establish an efficient spot market.

For those of us who have been through mergers, one of the clear advantages of a power pool is that there is absolutely no way that anyone can accuse you of exerting market power. No one will be able to point at my company and say, "You are manipulating access to your transportation system." I don't want any part of that. I will have my own generating company and bid in just like everyone else. There is a bright line around a power pool that the regulators can look at and make a judgment about whether it's a fair process in a very light-handed manner, rather than scrutinizing every transaction I make.

First Response:

All of these proposals offer potentially substantial improvements. But an equally urgent question from a regulatory point of view is not so much "*What* to do?", but *"How* to do it?" Among the criteria for judging any of these proposals should be, "How easy is this to implement?" An independent power pool looks great -- how do you do it? Do you sell off transmission or generation? How do you do *that?*

The regulatory answer is, of course, to start a proceeding. In the course of the proceeding, one or another of the participants is going to get upset and run to the governor's office and request a state-wide study group. New York's government has taken a somewhat different approach, and that's to buy a utility. Although this was not one of the options discussed by our speakers, it does have the

potential to satisfy a number of the criteria they mentioned -- albeit with some cost to the federal and state treasuries. It carries the prospect of immediate rate reduction; it unites stranded asset recovery with the transmission and distribution system. Having inhaled the utility, the government will have a strong reason to exhale the competitive assets. The British experience has revealed that it is much easier for the government to spin off generation and recover these charges than it is fora private company. In a messy world, this may be the best model.

Second Response:

In implementing the provisions of the Energy Policy Act, the FERC has recently put a number of principles in place. All of these initiatives are aimed at making the wholesale market more open and flexible and allowing innovation.

Recent FERC Initiatives:

- ***Move to lighter price regulation of wholesale generation, aiming at a fully competitive market.***
- ***Fairly aggressive in granting transmission access orders.***
- ***Develop flexible transmission pricing proposals.***
- ***RTGs and other parties filing transmission tariffs must meet* a *comparability standard.***
- ***Attempt to develop regulation allowing for reasonable recovery of wholesale stranded cost***

But there are some remaining questions which are important. What happens to stranded costs that arise on the retail level as states move toward competition? Should the FERC provide some sort of federal backstop in case the states fail to deal with the question? How much flexibility is possible in allowing different types of recovery? There are a variety of proposals for recovering stranded assets -- for instance, the FERC will have to decide whether to allow markup of transmission assets to replacement cost.

The FERC has also recently issued another order which asks a variety of questions about pooling arrangements and other possible industry structures. What are the merits of these arrangements? How aggressive should the FERC be in promoting a particular industry structure? How do existing arrangements meet the requirements of recent initiatives? Some utilities don't think we're being aggressive enough -- others think we've jumped off the deep end with the comparability standard. But these are some of the questions to which we'll be trying to find answers.

Competition and Environmental Protection

What are the impacts on integrated resource planning, demand-side management, and investments in renewable electricity options, if proposals to embrace competition are adopted? Are there options to mitigate the possible impacts that would complement wholesale and/or retail competition?

This is the first of two reports on competition and environmental protection. Because the major focus of environmental regulation of electric utilities has been air emissions, these reports only look at air-related environmental indices.

Speaker:

Over the past six months, various environmental groups have raised the following fears in conjunction with the impact of competition on the environment and the IRP process as it is presently constructed:

- Utility-sponsored DSM will be substantially reduced.
- Growth in investment in renewables will decline.
- Electricity demand will increase because prices will be lower, making emissions increase as well.
- Fossil fuel use will increase because of the economic advantage of old oil and coal plants, early retirement of uncompetitive nuclear plants, and reduced use of renewables and DSM.
- The governance process which has catalyzed the partnerships between utilities and the environmental community will deteriorate.

This report addresses these issues.

Demand-side Management

In the years between 1989 and 1992, DSM programs were expanded significantly. Energy savings increased by 200%, and dollars spent increased by 260-270%. This growth was heavily bicoastal. Projected growth is essentially in areas of the Midwest and the South, which haven't had much DSM yet. These areas have a lot of coal plants, so the growth in energy and environmental savings will actually be greater in the *next* four-year period.

With increased competition, some incentives for DSM will remain. One person we talked to called IRP "garlic against the werewolves." In a more competitive market there will be creative packaging of energy services, and one of these is likely to be DSM. Appliance standard review will still happen.

However, other incentives will not remain. Ratepayer subsidies will disappear. Decoupling measures and government intervention programs which mandate utility participation in DSM programs will disappear. To the extent that DSM creates new markets for energy-efficient products, which in turn creates incentives for new R&D, this too may change.

Many of these effects are far from rock-solid -- we could not find any good data which compared the effects of "market" DSM and "intervention" DSM. We were also not able to find enough industry-wide information on what we might expect in terms of market-driven DSM in a competitive market. So our approach was to look at two cases: a "less pessimistic case, which asks, "What **happens if** we lose 40% of the growth in DSM savings

between 1992 and 1997?"; and a "more pessimistic" case which asks, "What happens if we lose 70%?"

A 70% reduction in DSM will result in a 1.2% reduction in meeting $S0_2$ goals under the Clean Air Act and Climate Change Action Plan (CAAA/CCAP) goals, a 3% reduction towards the NO., goal, and about 7% of the CO_2 goal. So we're not looking at a big effect on meeting air standards for conventional and CO_2 emissions.

We also looked at this from a different point of view, which was to compare it with the effects of repowering. We took 1992's $2.25 billion investment in DSM and invested it instead in repowering 3000 MW of existing coal capacity with combined-cycle natural gas. The net avoided emissions from repowering were compared with emissions avoided by DSM under three scenarios -- DSM that replaced nothing but coal, DSM that replaced nothing but 'oil, and DSM that replaced nothing but gas. Our figures for repowering were very conservative -- probably about 15-20% higher than the lowest actual cost we've seen. Compared with DSM, the emissions reductions (with the exception, of course, that there are no $S0_2$ reductions from replacing gas generation with DSM) from repowering dwarfed those to be had from DSM.

Renewables & IRP

What we found in looking at renewables over the past fifteen years is that they are primarily driven by economics. The economics can be driven by tax credits or other tax programs as they were in the 1980s, but generally we haven't had a lot of success force-feeding renewables into the system. We were not able to find much evidence that IRP was having an enormous effect on investment in renewables, so it was difficult to determine what would be lost in a world without IRP.

Once again, our approach was to look at what renewables projections do in terms of emissions reductions. Presently renewables are 11.8% of total generation, and under the EIA's fairly optimistic projections they are expected to go to 13.5% by 2010, and equal amounts of investment in coal/natural gas and existing coal plants are replaced.. We looked at emissions using this projection, which assumes that renewables grow at twice the rate of conventional fuels. In the second case, we doubled the EIA projections for renewables, and additionally made the extreme assumption that 50% replaces new investment that would otherwise have been made in fossil fuel and 50% replaces an existing facility. The EIA scenario only gives us 4% of the $S0_2$ goal, 7% of the NO. goal, and 23% of the $_{CO2}$ goal - the last is a fairly high number, because we're beginning to take out a lot of coal facilities.

For reduction in renewables investment due to loss of IRP, we looked at scenarios assuming a 20% loss and 40% loss in renewables investment, and we also looked at a 10% gain, because many of the renewables folks we talked to felt they'd do *better* selling into a competitive market. Again, the increase in air emissions as a percent of the CAAA/CCAP goals was small.

Policy implications

The bottom line of all this is that programs which directly reduce pollution are much more effective than indirect programs such as IRP and DSM.

Right now, utilities are shielded from environmental risk, because these risks are easily passed on to the consumer. Fuel diversity, therefore, has not been a major concern in decisionmaking. But in a

competitive world, if you continue to invest in fossil fuels in a world where there might be increased regulation of fossil fuel use, be it through more stringent particulate emissions standards or carbon taxes or whatever, you'll be the one who has to pay those costs. So there may well be a stronger incentive to greater fuel diversity in a competitive power market. This is also going to have a significant positive effect on renewable investments and DSM -- this effect is difficult to quantify at this point in time, but it will occur.

The public has a significant expectation that the government will make sure certain things happen. We have talked about service quality and availability, and protection from price instability, but one of the other things the government has been and will continue to be called on to protect against is significant increases in environmental degradation. If any system is put in place that threatens to degrade the environment, it will not be acceptable. Just as any future system will have to be reliable, any system will have to deal with environmental quality issues.

What are the alternatives? With a "wholesale competition" model, you keep the IRP system but collect the money through the wires part of the business -- figure out how much investment in renewables you want to subsidize, and collect it through an access charge. This makes the cost of these programs much more visible, and therefore much more difficult politically. Other options -- pollution fees, emission caps, and environmental dispatch -- raise questions of political feasibility. In the next stage of this study, we will try to assess the feasibility and effectiveness of each of these alternatives.

First Response:

We are at a stage right now when all the major stakeholders have a veto over moving to a new and better world. Any of us can more or less make things so chaotic that it would take a long time and use up a lot of the benefits. The flip side is that none of us has the capacity to jam that new world into place without the help of the others. This strikes me as the classic opportunity fora deal. We all have a lot to lose, so we all have a strong incentive to find a common position that works for everyone.

In the electricity business, essentially all that environmentalists worry about is emissions. DSM and IRP are a means to an end -- we only care about them because they reduce emissions. Show us a way to get bigger reductions, and we will happily let go of DSM and IRP. The real question that environmentalists worry about is, "Can we get to a better system than the one we have?" The environmental community needs a self-correcting system, so we can get out of the business of being cops. We need an exit strategy -- a way to get in place a self-sustaining environmental regulatory system.

Existing plant cleanup is the most important thing that we should be dealing with. It is clear that we can pound on DSM in New England for the next 25 years and not get the same emissions reductions we would from cleaning up old plants. If we can clean the old ones up, we can walk away from DSM.

The next thing after the old plants is emission caps -- some kind of bubble over the region that would be allocated through market, as SO_2 is. We would need some sort of institution to do this – possibly by amending the current state implementation plans, or by modifying the job of the Ozone Transport Commission.

It's not clear that imposing new source requirements on old plants would get you much in other parts of the country, and I'd be interested to see the emissions reduction numbers by region. In some areas, it might not be a big enough deal for the environmental community to embrace it.

Finally, a question yet to be answered is the nuclear end game. If a competitive market shuts some of the nuclear plants down, it will be harder to get the environmental community to give up command and control in terms of decommissioning.

Second Response:

It is delightful to be part of a discussion which focuses on whether we're cleaning up the air rather than how we're going to get so many megawatts of renewables or DSM.

There is no structural incompatibility between competition and meeting environmental protection goals. There *is* an incompatibility between competition and the way we have been pursuing these environmental goals heretofore, via DSM and mandated renewables. The way we've been doing it, DSM and renewables may improve environmental quality, but they also drive down the wholesale market price. If you bring renewables in sooner than the market would have, you bring energy into the market sooner, and drive down the price. Same for DSM. If you're going to change the system so that people's asset value hinges on the market price of electricity, you won't be able to cram things down their throats that will make market prices lower. One criterion for evaluating any proposal ought to be: "How compatible is this approach with the wholesale market price?" We don't want to perpetuate the fight we have right now, where we ask generators to pursue an environmental improvement scheme which devalues their assets.

Along the same lines, some people have suggested that, because future environmental regulation is uncertain, we should preemptively change the way we do things *now*. This question deserves some scrutiny – if something might change in the future, what should you do to your assets today? In most cases the answer is: Nothing. Wait. There are very few instances where a preemptive guess at what's going to happen is the right competitive strategy with respect to an asset you already own. In the case of future environmental regulation, uncertainty may defer as many decisions as it accelerates. A harder look at the numbers might reveal that utilities *shouldn't* do more DSM in anticipation of a carbon tax.

Market approaches to environmental protection have produced strikingly better results -- in reducing S02, people are looking for innovative solutions and new technologies, whereas they're spending all their time just trying to dodge the bullet on NO_x. These approaches can make a great deal of difference to any solution -- for instance, if you decide to collect money from a charge on the wires to subsidize clean power, the worst thing to do is go out and use that money to sip contracts for clean power. A much better approach is to have people bid for the subsidy for clean power. An examination and articulation of some of these approaches might help lead us to a less economically intrusive and more politically palatable solution.

Finally, if CO_2 reduction is going to be on the table as a utility source problem, some investigation of offsets from other sectors would make a lot of sense. The potential for cost-effective reductions will be severely limited if we only look for them in the utility sector.

Discussion:

Question: Is it a generally accepted principle that current federal environmental protection legislation does not go far enough? That we need to go further at the state level?

: The Clean Air Act Amendments set the goals, but the states are having a great deal of difficulty coming up with compliance plans. The environmental community is trying to help the states find ways to make it happen -- we aren't just sitting back and saying, "We got the Clean Air Act -- problem solved clean air is no longer an issue." Will the changes in the industry give us a better way to meet those goals?

: I understand that, but why utility regulation? Is it the best lever?

: Actually, the discouraging thing in this report was what a small percentage of the necessary reductions we could get from the programs he analyzed -- this should tell all of us, "We've got a big problem."

: No, I think it says, "This isn't a good policy handle." The best method is the direct method -- put new source performance standards on existing plants, and pollution goes to zero. The way we're proceeding now, for instance with NO_X in Phase II, is economically crazy.

I agree with you.

The Role of the Courts in Emerging Electricity Policy

As the electricity industry reinvents itself, the courts will inevitably become involved in the process of determining its ultimate structure and direction. In what ways will the decisions that will emerge from the courts affect the process of "re-regulation"? Where are the functions of policymaking and judicial review likely to yield conflicts? This session reviewed an HEPG seminar which took a prospective look at the relationship between agency action and judicial review of those actions during a time of policy transition.

First Speaker:

There is one similarity between the regulatory agency and the courts -- we have to live with each other. In a very abstract sense, the regulatory agency views itself as being expert at complex policy resolution. It believes that it brings to the policymaking process the benefit of knowledge and history and broad inquiry, and that its function is quasi-judicial as well as quasi-legislative in nature. The regulatory agency views the court, on the other hand, as generally lacking the agency's specific expertise and familiarity with regulatory history of the industries it regulates. The court sees things a rather short-sighted way: it focusses on matters of statutory construction and process rather than policy, and knows only the facts placed before it. It intrudes into the agency's decisionmaking process by second-guessing the agency's decisions, it is not sufficiently deferential, and it is not sufficiently expeditious. This, in the abstract, is how a regulatory agency might view the court system.

The court, on the other hand, sees itself as charged with upholding the law under circumstances where the questions are frequently quite complex, and the parties before it often fail to clarify the relevant issues and their context. It feels it acts expeditiously given its caseload, and is not unduly intrusive of an agency's discretion. The court views the agency as relying too much on its "expertise" to justify a decision rather than offering a stated basis on the record for a particular decision. An agency's reasons for coming to a particular decision are often not stated within the four comers of the order under appeal. The agency is at times overtly political in reaching its decisions because it is susceptible to political intervention, and the court is a necessary check on this tendency when it exceeds statutory borders. Finally, there are some who feel that it is not inappropriate for a court to have a more "activist" role in policymaking -- that it can be a valid extension of the administrative process, and at times may even have an improved view, not being as distracted by the arcana of regulatory practice.

Fitting into this interaction are the utilities. The utility sees judicial review as injecting uncertainty into its strategic planning process. It is difficult for the utility to formulate long-term plans given that a particular order might be reversed, even years into the future. (Although it was mentioned at the seminar that this sort of risk has always been recognized and is internalized in the utility's value.)

Consumer groups view the court as a double-check on the work of the agency -- that agencies tend to go beyond what is allowed under law, that there is a real danger of "capture" by the utilities, and the court acts as a bulwark against this.

This is a very extreme and simplified account of the various interactions in judicial review of utility regulation. The reality is much more complex. But although it is naive

to believe that the courts make their decisions in the abstract, I do believe that they are not as well acquainted with many of the issues which are before us today, and that that limitation could conceivably create some problems **as** we move to a more competitive environment, because the regulatory agencies and the utilities are going to be increasingly unable to predict the outcome of their legal challenges.

There are some who feel that it takes so long for the appellate courts to rule on these decisions that the agencies might feel able to make some of the tougher calls that are required today. The downside, of course, is that the appellate process becomes irrelevant because of the supercesion of events in the meantime.

Today we have been talking about utilities restructuring themselves, transferring assets, and so forth. As they do this, I think we'll find more judicial second-guessing of agency decisions, absent substantial legislative change. In Texas, for instance, the utility statute states that there is no electricity competition. It would be very hard for the Texas commission to embark on a policymaking process which accounts for the emergence of increasing competition in the state without amending this statute. There will be significant decisions involving asset treatment and cost allocation between customer classes which might cause the courts some difficulty, to the extent that they deviate from precedent.

Ultimately, there is a fundamental conflict with the reviewing role of the courts in times when the agency is required to exercise creativity to grapple with new issues. Most of the case law records action by the courts to ensure that the agency is *not* overly creative. The courts just reversed a rule that the Texas Commission had crafted to address emerging competition in local telephone service, concluding that the agency had overstepped its discretion. We will see more and more of this – because this creativity will involve decisions which reallocate money, the courts will be increasingly called upon to review these commission decisions.

Having said that, there were some excellent recommendations at the seminar by members of the bench, to assist agencies in minimizing the involvement of judicial review in the policymaking process. For instance, many times the court can remand an order without vacation, so that the order can remain in effect while the agency is revisiting the basis for its order. The agency can also seek input from the court on the scope of its authority before it embarks on a significant general rulemaking. Evidently checking on the basic premise ahead of time is already in practice at the federal district court level.

Second Speaker:

The courts have no role to play in "emerging electricity policy". They don't pick winners or losers. If an agency comes in and says, "Utilities don't get to recover stranded costs -- they can sink or swim", and they can provide a rationale consistent with state law, the courts are not going to interfere in that outcome. That's not their job.

The role of the courts is in relationship to the agency itself. Agencies have enormous powers to adjudicate, legislate, and execute the laws the legislature gives them to administer. When Roosevelt created all his commissions, the American Bar Association said they were communistic because of the lack of checks on their action. The check that came out of that was judicial review.

One of the professors at the seminar

complained that the federal courts did not grant enough deference to the agencies in their efforts to restructure the industry. I agree that there seems to be something structural in the federal court system that makes them much more activist. I think this is an institutional phenomenon, and it will not change. At the state level, the courts are generally much more deferential, although there are exceptions. State judges consider themselves much more part of the process of government, whereas the federal courts have more of an "us versus them" approach.

The industry has changed so much in the past few years that any new decisions tend to stretch old statutory mandates. The courts are going to strike those down, because that's their job. It's up to the PUCs and the utilities to go preemptively to their state legislature or to Congress and say, "We need this statutory change in order to regulate the industry more rationally."

Finally, one of the biggest problems courts have in reviewing commissions is that judges are not experts at this stuff. Judges will hear a rate case and all the electric industry acronyms and shorthand, and then they will go back in their chambers and say, "Does anybody know what they want?" And in the end, if they can't figure it out, it doesn't always seem reasonable. So making an effort to explain something in English would be a big step.

Discussion:

Question: In terms of industry restructuring, what can be done under existing statute, and what will require legislation?

: Some of it could be handled under current statute. Transactions like asset sales, mergers, and so on are subject to commission approval to determine whether they're in the public interest. One problem that might arise is what to do if there is a gain from a sale of an asset, because the consumers are going to mount a strong argument about who gets the benefit of that gain. This raises the possibility that the court will hold that the agency overstepped its discretion. You can come away from a seminar like this saying, "We should not approve any more PURPA projects", but if someone comes to the court with a project and it meets all the evidentiary standards, it's going to be approved. Additionally, most of the codes were written with the economics of monopoly in mind, so it is very likely that, to put together all the parts of a restructuring, there may need to be some changes in a state's public utility code.

The Electric Utility of the Future

Speaker: Foreign competition is forcing U.S. corporations to downsize, restructure, and reengineer. On the government side, the state governments have also been learning how to do things better and faster and cheaper and smarter. That has led to some reinvention, with more reliance on markets and contracts. Up to now, utilities and their regulators have been largely exempt from these pressures.

When these changes come, people tend to panic: "Things are happening too fast -- we are going to have chaos -- we have to *manage change."* I saw a T-shirt the other day, that said, "STOP PLATE TECTONICS" -- another good one would be, "WE'RE GOING TO MANAGE CHANGE". Change cannot be managed. It is not an event -- it is a condition in which we operate. This happens with technology transitions -- when technology changes, like transistors turning to chips, you have a period that looks like chaos. We're there right now in the electricity industry. We have a regulated system with a little bit of competition.

We have to stop talking about the world as if it's a stable, linear system. The norm is not equilibrium and stability. Dynamic systems can seem very stable until something critical happens. There are several insights for the electric industry in chaos theory. In non-linear chaotic systems, small causes can have very large effects. They are also very sensitive to initial conditions. They are patterned at different scales, which means that, while things happen by chance, there are bounds on that chance and on how they react. The weather is a classic chaotic system -- it has a huge range of behavior on many scales, but it remains bounded within some broad limits.

Finally, chaotic systems are heavily dependent on feedback loops -- order comes out of chaos through information and iteration. Remember the speaker who said that we have to find a self-correcting way of doing environmental protection? That's the way we have to re-think the way we regulate the industry. Like a chemical reaction which organizes itself over time.

Looking at corporations in the future, we have to get away from the idea of predictability. Stability now means the ability to respond and adapt to change effectively and in a timely manner. "Double-loop" learning is an important skill -- you make the adjustment, and then you go back and ask if the norms still make sense.

What are the essentials for future regulation? Ikebana is the Japanese art of flower arranging. It is based on several principles: simplicity, imperfection, transitoriness, and trying to find harmony in patterns. These are the principles on which regulation will have to rely in the future.

Retail Services: Opportunities Unlimited

Speaker: As we've talked about wholesale markets and direct access, the focus has been on its implications for stranded assets. This comes from a utility perspective, which is based on book accounting. In fact, a utility has two major assets. One is the generation assets that they're worried about, and the other is their brand franchise, a whole range of things which includes the distribution channel, the customer, and customer trust. Distribution

is a regulated business -- retailing is not. These are retailing functions.

Of course, if your whole focus for building your business is on your books, you will tend to concentrate on your generation assets that are at risk, and not on what the greater value may be for the utility, which is maximizing the value of the relationship to its customers. Retail access poses at least as large a threat to the whole retailing asset as it does to generation.

The electricity business is three separate businesses -- generation, transmission, and distribution. Think about the four or five characteristics that define what a business is: Who are the customers? What are the factors that will allow you to compete successfully? etc. Transmission, although it might change slightly, will remain a regulated common carrier because it is a natural monopoly. Generation is going to be a true commodity business that you won't be able to embed much value in. It will be highly cyclical, with wide price swings. The most interesting business to be in is going to be the distribution business.

The market value of a company is driven by three things: What are my returns on assets? What are my prospects for growth? How risky is my business? If you think about transmission in terms of how it will be valued by the market, it's a wash -- however it is regulated, it will have regulated returns and be relatively low risk. The market is going to value generation assets much lower than it has historically, because the returns on a commodity business are low, there's little growth, and risk is way up. So the contribution of the generation business to the share value of a utility will be radically lower.

The regulated transmission business is going to be trying to maximize the utilization of transmission assets. Ultimately, you have to run the transmission business to see how much you can get Enron to use your system. This means making it the most transparent, easy to use system.

The distribution business is much more interesting. If it is treated as a retail business, it might be possible to create a great deal of value. The retail business of electricity has been undermanaged fora long time, and we all know that, when someone starts managing an undermanaged business, it can show spectacular results. It has been undermanaged because it has been treated as an asset on which you earn a return, rather than a customer franchise where you try to provide service to the customer.

Competition and unbundling of services limits the value of vertical integration. In the oil industry, even if you're the biggest producer, you can still lose your shirt in the refinery business, because there's a market price for crude oil and a market price for refined products. Vertical integration, *per se,* does not make a refining business successful. Being competitively advantaged in refining makes it successful.

Top Five Utility Myths:

- ***The electricity industry is different***
- ***The longer we delay the better***
- ***There are competitive advantages in being vertically integrated***
- ***Electricity is a commodity***
- ***Avoiding write-downs will protect shareholder value***

Unbundling is unavoidable – as soon as we had wholesale competition, the unbundling of transmission became unavoidable, because you can't have one without the other. Direct

access for retail competition will also force unbundling of the distribution business -- no matter if it's through municipalization, retail wheeling, co-gen -- whatever you want to call it. The day MCI is allowed to offer you service, one of their first questions to PacBell will be, 'Tell me how much of that charge is meter reading -- I'll handle that directly with the customer", or "Tell me how much you spend on crews responding to problems in people's homes -- I'm not going to be needing that service." We talk about wholesale competition stranding generation assets -- direct access will strand distribution overhead.

The distribution system will be three businesses: the "wires business", that essentially parallels the transmission business, at a lower voltage; unbundled regulated services to those customers who want to buy them one at a time (and bundled ones for those who can't or don't want to. Everybody is spending all their time worrying about who *can't* switch -- if I were a utility, I'd be paying attention to the ones who don't want to switch even if they *can);* and a wide range of unregulated services like risk management instruments and demand side management services.

Distribution is more than a business whose job is to protect the rest of the utility from bearing the costs of stranded generation. This is actually a very flawed strategy, because it allows people to cherry-pick high-cost services that have generation embedded in the cost. This gives you market share losses, and as you lose market share you strand a lot of overhead and capital -- corporate headquarters, billing systems, etc. It also undermines your customer franchise. By the time you get done winning the battle by saving $1 billion of book assets you might have lost the war by destroying a few billion dollars **worth** of trust that you had "off the books" in customer franchise.

This process of what happens when customers get choices is perfectly decipherable -- it's happened in many other industries. What the winners have done and what the losers have done is largely the same across all of these industries. The distribution business should be managed to blunt retail competition and to maximize margins and create value added for growth.

There's a phrase I heard in Texas, "The only thing you find in the middle of the road is dead armadillos." I hear everyone in the utility business saying, "I'm going to delay retail access to protect my generation assets, but I'm going to take preemptive action to be an innovator on the customer service side." These two strategies are not consistent -- you can't use your retail business to slow down the wholesale side and speed up on the retail side. All successful retail companies continually cannibalize their old products for new ones, and the companies that try to maintain the life span of their old products are always the losers as the customers and their demands change around them.

The challenge in retailing is to avoid the "Commodity Trap": **:**The customers are the same, the product is the same -- one size fits all. The only thing that matters is price." This is a self-fulfilling prophecy. How do you avoid the Commodity Trap? At the strategic level, you have to redefine and resegment the markets. Market segments are *not* rate classes. Most of the people who think they're being innovative still have their customers in rate classes -- they just give them funny little names.

It is common to hear managers in regulated businesses say, "Well, I can either be low cost or I can be high service -- if I have to provide all these services, it's going to be more costly." The best retail companies -- Federal Express, Southwest Airlines, Walmart -- are

able to engineer strategies that allow them to offer the best service *and* the lowest cost. To pursue one to the exclusion of the other is a very exposed strategy, and invariably you end up trading market share against margin. A better approach is to develop a strategy which delivers low cost service and adds value to this cost structure.

You still have to be low cost. You have to innovate in terms of services. You've got to use pricing more effectively than just cost buildup. What this requires organizationally is creating "brand managers", just like other businesses. If you go into a cereal company, every brand manager doesn't buy flakes and put sugar on them and put them in the box. But there's a guy who thinks about Sugar Pops customers and how to price Sugar Pops, a woman who sells Corn Flakes and how much advertising to buy -- it's organized by segments, so that you get the low cost structure to deliver the product but you also get the value-added focus on *how* you deliver it.

Gasoline stations used to provide three services: gasoline, repairs, and parts. We now have a third of the gas stations that there were in the 50s and 60s, because customers changed their view of what they need. Dealers pulled in part of the repair market, and specialty repair shops where guys do nothing but change mufflers all day long pulled in another part. They don't have to pay for sites where the traffic volume is high, because you only change your muffler once every two years. And the Walmarts pulled in the parts -- you're going to the grocery store anyway, why not buy spark plugs and oil there, too? When you think about electricity markets, you have to think about customer needs and preferences, cost to provide that, and competitive challenges.

A word about pricing. Airlines used to price by the mile -- any time of the day, any number of passengers, it was all the same. Today, we all get the same **crappy food, but everything else is different -- the guy next to** you might have paid a tenth of what you paid. I'll pay the premium for the flexibility to make my reservation at the last minute and not fly on the weekend. It's a pricing segment, and it has nothing to do with the cost.

Service is the **same. The telephone business used to be one size** fits all. They take care of the phone in your house, everyone gets free operator services -- we took it for granted that that's the way telephone service had to work. Now you can pay separate insurance for wire repairs in your house, you can buy a phone at the pharmacy, and there are a million new services, like caller id and answering services -- all trying to leverage the system technology to keep other companies from taking your customer. There are some electricity customers who must be marketed to to reinforce their latent desire not to switch service providers. MCI and Sprint are cheaper how many of you are using them? Nobody -- we're too lazy. That's how AT&T keeps 80% of the market -- by running ads that make us feel like it's ok to be too lazy to figure out. More and more people are going to figure out how to switch from their electric utility, and the utility needs to figure out how to convince those core customers to stay.

Small customers are the most difficult fora competitor to get access to because initial infrastructure **costs to** market to that segment are high. Big customers are easy to get access to, and that's why the competition breaks out with them first. But for an electric utility, the big customers aren't worth having. Whichever bank won the competition for GM's Treasury work didn't make very much money -- GM is too smart to let them. The large customers capture most of the value of the competitive market -- some utility will get them, but the margin will be very low.

Banks make money these days chasing the middle market. That's where the margin is high, the incremental cost of access is within reach, and the value of service can still be maximized. Every industry goes through this -- after they beat themselves to death competing for the big customers, they figure out that the small industrial and large commercial customers are where the margin is.

Obviously you have to be aggressive in developing services which add value. When Enron offers caps and collars and long-term prices, they're taking a commodity and adding value -- suiting it to the needs of a customer. If you can turn on someone's air conditioner half an hour before they get home, that's a value-added service. We're making customers do their own power conditioning -- why isn't that a service the utility offers?

It is very easy to lose customer franchise value. It is extremely important not to approach this by trying to drag as much money as you can out of your customers and then at the last minute before they leave switch around and try to be a good guy and give them cheap power and stuff.

In the short run, the utility distribution business has some down sides. It's going to be forced to unbundle, there's going to be fighting over market share, and there's going to be margin pressure. The up side is that it's not a utility -- it's retailing -- and one of the things you should negotiate with your commission when you make the deal about how many assets you can write down is the flexibility to benefit from owning a retail business.

Discussion:

Question: I disagree with the notion that the market has already written down utility assets based on their competitive value. If that were true, shareholder value would be zero for many utilities right now. Utility managers are tom between trying to prepare for competition and knowing that, by preparing, in the near term you may destroy the company.

: Obviously the market doesn't believe that generation assets have no value in California, but it believes that they're worth appreciably less. This is going to happen any place the market sees a greater likelihood that high cost assets will be exposed to competition before they return their cost.

But if you try to delay the process for five or seven years to allow the assets to depreciate, you're actually only going to save a modest percentage of the total assets at risk. The "If I can delay competition, I can get through this" strategy is not a good answer for utilities. You're better off striking a deal on the assets with the regulators early and then getting on with things.

: I think the market is valuing some kind of transition arrangement. But from a public policy point of view, as long as there is that much rent out there at risk, a lot of people are going to spend a lot of money either trying to keep those assets and high prices or undermine them. The message that is consistent with both the public and private interest is to get the allocational issues behind us as soon as possible so that we can move ahead with the organizational and regulatory changes we need to make.

: That's right, and that's why it's important to get a deal that allows value to be created on the distribution side -- for both customers and service providers. You'd like the utilities to be doing that to the best of their ability and not saying, "Everything I do to create value is going to accelerate the stranding of my assets." Among regulated

industries, every time the companies have been preemptive in getting out front to frame the debate and get a better answer, they do much better than when they play catchup to the ideas the commissions put forward.

Question: Is reliability on the distribution end going to be a retail function?

Regulators obviously have an appetite for making sure a certain level of reliability is maintained. But even if there were no regulators, any rationally motivated manager of a distribution business would still view reliability as important.

: I don't think vertical integration per se is anti-competitive, depending on how it's managed. We proved that in the pipeline business. However, I think a great deal of the industry will de-integrate anyway. There will be some companies that want to go into the distribution business in a big way, and others that say, "I love the generation business, I can't stand being a regulated company." You'll need to have anti-trust regulations and so forth to deal with all of these new businesses, self-dealing, cross-subsidization, and so forth. We can meet all of these requirements without mandating disaggregation, but I think we'll see a fair amount anyway.

In about 1974, we actually got natural gas deregulation to a vote on the Senate floor. With no debate, no analysis, no nothing, Senator Kennedy proposed a horizontal divestiture amendment, and it came within three or four votes of passing. He came right back with a vertical divestiture amendment and it came within one vote of passing. I remember holding a press conference and saying I was worried he was now going to propose diagonal divestiture and it would pass as a compromise. He was taking on structural issues that had nothing to do with competition or the economic efficiency of the market. The same thing is true with this industry -- we can get to an efficient market without mandating the structure of the industry.

Question: What's the minimum amount of regulatory change that needs to happen to clear the way?

: I think a Poolco helps, because it gives you a double-blind situation which sterilizes the transactions within a company which owns both distribution and generation.

Question: Do you have examples from other industries where stranded assets were handled well or handled poorly?

: There are no examples of handling stranded assets well. This is a painful process. It is no fun to go to hearings and talk about how much stupid investment you ought to be able to recover. The industry is not going to be able to avoid major write-downs, but they're going to try.

Competition, Coordination and Transmission Pricing

Coordination of some or all flexible plants through a central dispatch is necessary to support a market. The associated market prices have a close connection to transmission opportunity costs Different approaches have been taken for linking the spot market and transmission pricing.

Two days before this conference, the FERC released its proposal on transmission pricing and a notice of inquiry on pooling arrangements. As a result, the national debate will be moving into a new level of detail on these issues This session explored the operation and differences between pooling systems in Norway and in Chile, and how these ideas might be transferable to the United States.

Speaker:

The Norwegian generation system was made fully competitive in January of 1991. We have 70 generators in the country -- the ten largest account for two thirds of the total capacity. There is a single transmission company which is a state-owned national monopoly which uses postage-stamp rates based on short-term marginal cost plus a bottleneck fee and a residual, and we have an open pool in which anyone can participate. The distribution utilities are two businesses: a distribution system which is regulated as a national monopoly, and a competitive final sales business.

Before the restructuring, customers could have bilateral contracts with generators -- they were difficult to negotiate, but some did it. These were simply renegotiated when the pool was opened. The pool had been a club-type arrangement between the 20 largest generators, and no trades across utility borders could be arranged.

The spot market that we have in place now is a day-ahead market, with both buyers and sellers participating. All tariffs in the transmission and distribution networks are public. It is a common misunderstanding that Norway has a purely bilateral market. We have a well-functioning pool, into which about 10-15% of the power is bid. We have debated the question of whether we should require all power to be bid through the pool, but I think that would create more risk -- the bilateral contracts smooth out price spikes and keep the big companies from trying to drive the pool price up. Distribution utilities and other customers can buy directly from the pool, or they can shop around the pool. The important thing is that the pool establishes the market price which is the reference for all other contracts.

Should the price go down when you have a competitive system? Prices on the wholesale market in 1993 were down 8% from 1991. Prices were lower for most customer groups. We have had price spikes and dips in the pool, which is encouraging because the generation business is risky. Commercial customers saw an average 7% price decrease, but those that were on ordinary tariffs saw nearly 12%, which is fairly dramatic. Because of high transaction costs, "captive" residential customers have been slow to enter the market. Those who have renegotiated contracts have seen a 7% price decrease. We are working on simplifying settlement agreements so that these transaction costs will be lower.

Second Speaker:

In 1978, a group of economists and engineers started reshaping the Chilean economy in a very radical way. The country was under a military government at the time,

so these changes were not well known outside the country. The laws were changed to actually implement these ideas in 1982, and recently other South American countries have been following the Chilean example.

The central idea of the law was to create market conditions where possible. The only place we thought that could happen was at the generation level. Coordination of transmission and open access were thought to be the keys to competition, and also to ensure the reliability of the system. It was thought that, at the distribution level, we had to have geographic monopolies. So the structure of the law, as it was developed, provided for an obligation to serve at the distribution level and an obligation to provide access at the transmission level.

The pool facilitates coordination of transmission and determines the spot price for transfers among generators. The pool is what we call an "economic load dispatch center". It does not establish a price through bids -- our generation is 70% hydro, so the pool price is calculated based on water availability costs. We had a very wet period recently, and the spot price actually went to zero part of the time.

Aggregated distribution costs are figured out by a yardstick concept. Distribution companies are divided into four groups, and each group is compared with a model efficient company. This approach obviously has problems, and every four years when this is renegotiated, everything becomes very unstable and the stock prices are affected.

Transmission is priced through a two-part revenue. There is a "tariff revenue" which is determined by the pool from the differences between spot prices in different locations. This congestion factor was never large in the past because the government had over-invested in transmission capacity -- it is beginning to come up more often in the south, where we're developing some congestion.

The second part of the transmission price is a supplement based on use of system capacity, which is negotiated with the transmission owner by generators who wish to use the system. This loosely-defined scheme has created some problems -- capacity allocation has been disputed, and there are no signals for future investment. Feeling that the spot price component is enough of an economic signal, we have proposed changing the supplemental tariff to a postage stamp scheme for settlement of allocation.

When the system was originally restructured, no one thought the transmission system would be a good business, so it was kept protected under the largest generator. This created a lot of problems -- so the pool regulation system was devised and the system is now almost fully private.

The system overall is now working very well. Market information is transparent. We have stable real prices compared with gas prices and other fuel sources, although the pool price can vary quite a bit depending on water availability. Competition is increasing. There is enough private investment so that the government does not have to intervene.

There have been good "side effects", too. Other South American countries have benefitted from our experience. Availability of generation plant in Argentina has gone from a low of 47% in 1992 to 70% this year, which has an enormous effect on the productivity of the economy in general. The managers of utilities in Chile have developed a great deal of expertise, and are now beginning to invest abroad very aggressively -- the first distribution company to be privatized in Buenos Aires was bought by a distribution company in Chile.

Third Speaker:

I would like to draw on what these two speakers have said with regard to what it means for the U.S. Based on what we have just heard, **I** ask you to accept the generalization that, in order to allow commercial flexibility in a competitive electricity market, there has to be some kind of coordination.

Both of the systems we've just discussed have excess transmission capacity for various historical reasons. They have the right theoretical solution in place for dealing with congestion, although it hasn't been quantitatively significant yet, but this relationship between pools and transmission is very important when dealing with transmission congestion.

Many places in this country have transmission congestion problems that arise because of thermal limits on the lines, stability limits, voltage limits, and so forth, and that congestion is a real cost of using the system. When we make changes to the way we provide transmission service, it is important to make the distinction between access and capacity and make sure we come up with a solution that handles both.

The difficulty is that we can't even *define* the physical capacity of the grid, much less allocate it, because the capacity keeps changing with changing load patterns. But if we think of it as transmission rights, instead of capacity, those rights can be related to the service that is being used with a pricing scheme. As we've just heard, this is what they do in Norway, and it had been proposed by two of the utilities in California.

Although it is impossible to allocate 100 megawatts of transmission capacity to someone, you *can* guarantee that either they'll be able to deliver 100 megawatts or they'll be compensated if they can't. Since it is the relative congestion on the system that would keep the delivery from happening, the compensation comes from a congestion fee that is part of the price of transmission service. If you have a pool, as they do in Norway, you can figure out this congestion fee by comparing the difference between locational spot prices -- essentially how much the price was where you put the power in versus how much the price was where you took it out. You add this use-based component to an access fee or service charge for the other parts of transmission service.

Of course, you can also have long-term transmission contracts to cover different risks -- these will be outside the pool, but using the pool price as a reference. There are several things you have to do in order to adopt this system, like allocating rights to existing lines, but this is essentially how to build use-based economic signals into transmission pricing.

Fourth Speaker-.

New England is currently engaged in an effort to forma regional transmission group (RTG), to address transmission issues like access, comparability, and pricing. As transmission is reformed, however, the organization of the New England Power Pool will need to be altered as well.

A necessary step in these parallel efforts is to identify how the RTG issues and pool issues interrelate. For instance, it is clear from the experience in the U.K. that it is very important to have a pricing scheme which generates signals for efficient siting. We had originally proposed individual company tariffs, but the direction I'm seeing from many of the players in this effort is that they want the transparency and one-stop-shopping

convenience of a pool-based tariff. A potentially sticky issue, however, will be whether the state commissions are willing to substitute a market-driven signal for an administratively-determined need for new capacity.

Congestion is very rarely a problem in New England, so we can get away with not having a congestion component of transmission pricing. That could change, but right now there are more contentious issues to tackle.

Discussion:

Question: We have been talking about creating market-driven signals for new generation. How is this working out in Norway and Chile?

: Financing for Norwegian power stations has come from both Norwegian and international sources. A current question is how much Norwegian power should be dedicated to export -- for instance, there is an application to build a gas-fired station to export power to Germany. Should we transport the gas to those countries or should we trade electricity? The Norwegian government must decide this.

: The generating companies in Chile are doing well enough that they are able to invest on their own. There is, however, investment also coming from abroad, and some of the companies have brought their stocks to U.S. markets to raise funds -- so there is a collection of different sources.

Handouts for Harvard Electricity Policy Group Fifth Plenary Session, Oct. 27-28, 1994.

Some of the materials listed below were prepared specifically for the meeting. Please do not cite any materials marked 'Draft. "

- Cajun Electric Power Cooperative v. FERC. U.S. Court of Appeals, D.C. Circuit, No. 92-1461. Opinion, July 12, 1994.
- Cullen, Lee, Gary Mathis, Dennis Ray, and Rodney Stevenson. Policy Options for Competition in Wisconsin's Electric Power Industry. Wisconsin Public Utility Institute (School of Business, University of Wisconsin-Madison), September 1994.
- Duquesne Light Co. v. Barasch. 488 U.S. 299, 316. January 11, 1989 (excerpt).

FERC. *Alternative Power Pooling Institutions under the Federal Power Act. Notice of Inquiry.* Docket No. RM94-20-000, October 26, 1994.

FERC. *Inquiry Concerning the Commission's Pricing Policy for Transmission Services Provided by Public Utilities under the Federal Power Act: Policy Statement.* Docket No. RM93-19-000, October 26, 1994.

Hogan, William W. *Coordination for Competition in the Electricity Market.* Draft presentation, October 27-28, 1994.

Hogan, William W. *Coordination for Competition in the Electricity Market: A Contract Network Approach.* Draft, October 12, 1994.

Hogan, William W. *Real Customer Choice through Efficient Direct Access.* Draft, September 29-30, 1994.

Kahn, Alfred E. *Can Regulation and Competition Coexist? Solutions to the Stranded Cost Problem and Other Conundra.* Electricity Journal 7(8), October 1994.

Lee, Henry. *Competition and Environmental Protection.* Draft presentation, October 27, 1994.

McDiarmid, Robert C. *The Role of the Courts in Emerging Electricity Policy.* Draft, October 13, 1994.

Moen, Jan. Chapter on unbundling of Norwegian Electric Supply Industry. Draft, September 11, 1994.

Moen, Jan. Untitled draft presentation on the deregulation of the Norwegian electricity market. October 27, 1994.

Moskovitz, David, and Douglas Foy. *Looking for Peace in the Middle of a Nervous Breakdown.* Draft version of paper prepared for publication in the Electricity Journal, Nov. 1994.

- Moskovitz, David. *Searching for Peace.* Draft presentation, October 1994.
- Murphy, Joellyn. *The Electric Utility of the Future.* Draft presentation, October 27, 1994.
- National Independent **Energy Producers (NIEP).** ***Is Competition Here? A Preliminary Evaluation*** *of Defects in the Market for Generation.* Draft, October 27-28, 1994.
- Page, Thomas. *The Path to Industry Reform.* Draft presentation, October 27, 1994.
- Pierce, Richard J. *The State of* ***the Trans,t,on to Competitive*** *Markets in Natural Gas and Electricity.* Draft, April 1994.
- Rudnick, Hugh. *Transmission Open Access in Chile.* Draft, October 27-28, 1994.
- Rudnick, Hugh. *Competition, Coordination, and Transmission Pricing. Open Access in Chile.* Draft presentation, October 28, 1994.
- Sant, Roger W., and Roger F. Naill. *Let's Make Electricity Generation Competitive.* Draft, June 23, 1994.
- Skilling, Jeffrey. (draft presentation)
- Southwestern Bell et al. v. PUC of Texas et al. Court of Appeals, Texas Third District, No. 3-93-552-CV. Opinion, Sept. 21, 1994.
- Zausner, Eric. *Retail Services: Opportunities Unlimited.* Draft presentation, October 28, 1994.