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**Harvard Electricity Policy Group
Special Seminar on Environmental Initiatives**

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Meeting Summary

*Debate associated with the restructuring of the electric utility industry has moved from questions of **whether** restructuring should take place to the details of **how** it should be implemented. A prominent question in this current debate is, "what will happen to the social benefits afforded by our regulated delivery system in a deregulated industry?" Accordingly, this HEPG seminar focused on how environmental benefits could be retained in a restructured industry, particularly those provided by demand-side management, energy efficiency, and renewable energy programs. The morning seminar session focused on access fees/system benefit charges as mechanisms for funding DSM and renewables. The afternoon session focused on regulatory performance and portfolio standards.*

This document summarizes the presentations and discussions at this seminar. They have been edited for clarity (of context) and brevity. The names and affiliations of attendees as well as a list of materials circulated at the meeting are attached, for further reference.

Session I. Access Fees and System Benefit Charges

Access fees, or "systems benefits" charges have been proposed as a means for funding energy programs that provide social benefits. Initiatives such as demand-side management, renewable set-asides and low income subsidizations might qualify for proceeds from a charge assessed on users of distribution services (or perhaps on users of transmission services). While many parties have expressed interest in this approach, the proposal raises a number of questions that have yet to be addressed. For example, how should regulators compute the level of such a fee? Can we assume that the money would be, or even should be targeted to DSM and renewables? What are the overarching

goals for which the money should be spent? Who should allocate the money collected, and by what criteria should it be allocated? Will a levy on electricity distribution in the absence of a similar levy on natural gas distribution create market distortions? Would an access fee be politically robust in the face of increasing pressure to reduce the price of electricity? Finally, can such a fee be made non-by passable, if so, who has the authority to do so?

The discussion of these questions is summarized below.

Primary Speaker:

I'm going to focus my opening remarks on what I call the "universal system benefits charge". This charge, if implemented correctly, will serve as a tool for delivering environmental and economic benefits to a restructured power system. For the sake of argument, I will assume that we are part of an electric system that wants to make these investments. Making this assumption we can address questions of *how we* can ensure that a system benefits charge is well-designed.

The primary dilemma of designing this benefits charge is illustrated best by an example. Let's assume that I am the CEO of a hypothetical utility. My company is operating in a world of performance based regulation which limits me to selling kilowatt hours at an average of seven cents. If it costs me two to three cents per kWh to generate or buy short term, I will clearly recover a good deal off each kilowatt hour sold. My company can keep the difference between the short run operating costs and what it sells for. Efficiency investments would thus constitute an expensive, and probably unsustainable, charitable contribution from my shareholders to the general public.

And so what do we do, if we accept that my service territory would realize significant

economic and environmental benefits through efficiency investments? How do we transform efficiency investments into a sound business proposition?

I think the first thing we have to do is to get energy efficiency investments *out* of the commodity rate. That is what the distribution charge will allow us to do.

When I say get it out of the commodity rate it is important to recognize how much and how little I am saying. I am not necessarily saying you have to change rate structures. I am not necessarily saying you have to change what the bill looks like. I am not saying that you have to change anything about the way cost recovery and revenue allocation is now done. All that we must do to take efficiency investments out of the commodity rate is reclassify the cost as a non-by passable charge on the use of the distribution system. I believe states can do this pursuant to their jurisdiction to regulate and allow recovery of their costs over the distribution system.

What might go into this universal system benefits charge? I would argue that the obvious candidates would include energy efficiency investments, above market (but socially cost-effective) renewables costs, and low income subsidization. To make the charge effective, the distribution system's profits

cannot be tied to throughput.

Jurisdictional Issues

Notice when I talk about a charge to the energy distribution system here, I am not suggesting for a moment that any of these costs have anything to do with the physical costs of distribution. This is okay. State authority over the distribution system carries with it, in the view of the state commissions that I know, a clear authority to recover the legitimate costs of system wide electrical service through a distribution charge. You don't need federal statutory authority to do it. The authority of the states to allow recovery of these costs goes back to the traditional roots of state authority. The fact that you are designating the distribution system as the place where those charges are collected does not present a statutory or jurisdictional problem.

The recommendation that I submit to all of you is to urge FERC to define end use service in a way that will allow a distribution charge to be non-by passable. Anyone who takes end use service off the integrated system should be considered a distribution customer, upon whom usage based charges can in fact be levied for purposes of avoiding stranded benefits. Customers should not be able to bypass system benefits charges by raising your voltage or changing their physical line configuration.

Computing and Spending the Fee

The next question to be addressed is how one should compute and target this fee and under what auspices should the social benefits not be spent. I assume that we will continue to look at energy efficiency investments as we have in the past, from a societal perspective. That is, we should continue to invest in efficiencies if the savings are less costly on a life cycle basis

then the replaced generation. Given recent experience with DSM programs, we are in fact better equipped to determine what these costs will be than we have been in the past. The funds raised by the fee should be sufficient to cover acquisition of these socially cost-effective investments. Again, the reason for doing this is to minimize market distortion.

Also as in the past, utilities should be the ones who make these investments (subject to performance tests and accountability). This will capitalize on the enormous progress that utilities and regulators have made over the last decade in learning how to evaluate and assess the net benefits associated with energy efficiency investment. If we move into a world where there are separate distribution, transmission and generation entities, I think the distribution entity should make the efficiency investments.

Customer Flight?

So what might this charge mean in terms of additional cost to end-users? I don't believe that there is a system in the country that couldn't do this at 5% of the current bill or less. This proposal is not purely abstract. A distribution charge to recover energy efficiency investment is currently in place in Washington state and Idaho. The charge was adopted by commissions responding to petitions by Washington Water Power. The charge adds 1.5% to the cost of a kWh, and it is used exclusively to recover energy efficiency costs.

Now I come to a crucial issue, is the value of the integrated grid so low that a 5% (or less) charge will cause customers to leave it completely? It is important to note that most customers are already paying this in their current commodity rates. The universal access fee simply pulls the cost out of the commodity

rate. Thus, the bypass risk is probably manageable. .

Political Feasibility

The last question I will address is whether the access fee will be robust in the face of pressure to cut rates. First of all, we do not have a commodity price crisis in the electric industry. Over the last decade average rates, adjusted for inflation, to large customers have fallen by 25%. Average rates for all customers are down by a little less than 20%. So, although we do have continuing price pressure, we are not facing a situation that could be construed as a commodity price crisis.

I think this approach can work politically so long it includes a system of accountability that is credible. That is, it will not be possible to couch it as a nifty new way to fund the University of California. The fees will have to be used to deliver clear and palatable benefits back to the electric system. If you can show that the benefits are going back at the level of magnitude that are suggested by the new portfolio data from California and New York (where benefits since 1990 are in the multi-billion dollar range), then the system should stand up to criticism.

In closing, I want to reiterate that states, utilities and other stakeholders have the ability to make this universal system benefits charge work, if they want to.

First Respondent (state regulator):

A few points in response to the speaker's presentation:

- The speaker is correct in saying that the size of the charge is a critical issue.

0 Estimates of the total value of social costs are imprecise. Finding plausible values, for each state, is important. In my state these costs will vary across regions and utilities. They will probably range from 1% to 2% of total electricity costs.

0 I'm not as confident as the speaker that the states have the authority to implement such a charge. It is likely that stranded benefits will confront the same sort of legal issues as stranded costs. This would certainly be true if states were to take the reverse course and use this as a way of killing retail competition. Such charges might even raise interstate commerce clause issues.

0 Even if industrials don't leave the system because of a 5% distribution charge, the political risk of imposing such a charge is enormous.

0 Before you start including benefits you have to ask how stranded the benefits really are: are DSM renewables, fuel diversity and future generation really stranded? Wind plants that bid at 3 1/2 - 5 cents/kWh appear quite competitive.

0 I think that there will be some competition for funds between the various types of benefits. Some officials will be ready to say goodbye to DSM in favor of poor people, others will favor the reverse.

Second Respondent:

In evaluating any approach to fund environmental benefits, we must remember

that utilities are businesses. Utilities are not going to do anything which puts them at a competitive disadvantage. The primary yardstick will be customer choice as measured through responses to price signals. As a result, traditional utility subsidized DSM, although beneficial, may not be appropriate in a fully competitive environment. Other approaches must be sought.

I think we all want customers to receive the benefits of fuel diversity and energy efficiency; the question is how do we pursue those benefits? Efficiency standards, market transformation and technology commercialization have not yet been mentioned, yet may be viable mechanisms. Rather than alter customers purchasing habits, it might be more beneficial to change the spectrum of manufacturers' products available on the market.

Finally, a program needs to be flexible. To be sustainable, it needs to be robust enough to overcome incorrect forecasts and changes in circumstances.

Third Respondent

The speaker gave us an excellent solution to the benefits problems, but skipped some key steps. I submit that formulating public policy in this area is facilitated by a three part framework that begins with *values*.

What are the fundamental values that drive the entire American enterprise? From values you derive *objectives*. Having decided on these, you must find *actions* which will achieve these objectives. The speaker jumped to the objectives and asked how we might implement the actions that made sense historically in a vertically integrated regulated monopoly utility; **DSM, IRP** and renewables. This is the

wrong side of the equation to look at. I think we need to focus on the objectives. As we contemplate different industry structures the values and objectives will remain the same, but the appropriate actions will change.

Some of the objectives, such as energy efficiency, might be obtained via a richer array of market mechanisms with minimal regulatory intervention. Energy efficiency may not be the right question. One of the main drivers for restructuring is economic efficiency, to which mandated energy efficiency programs will have less to contribute to in the future. Therefore, the case for government intervention to promote energy efficiency will have to be justified by the environmental *benefits* of such measures.

Finally, although utilities have historically been resource portfolio managers, this will not likely be the case in the future as industry structure changes. The resource portfolio function will resemble what it is in the financial markets - some will use stocks, some bonds, and some mutual funds.

Speaker Response:

I passed over a discussion of values and objectives so that I could focus on the mechanics. In order for the mechanics to be relevant, we must agree that the electric utility industry is very much affected with public interest.

To the second commentator, I would argue that the different "worthy" causes have shared very limited space on electric bills for over fifteen years. The causes are in fact synergistic and I expect that the respective interest groups will argue that their causes are collectively critical to a sustainable and equitable energy

future.

In response to whether DSM is really stranded, if one looks carefully at pricing of energy efficiency, the need for energy efficiency investment to continue to deliver these economic and environmental benefits is probably greater under the new system than under the old.

Discussion:

Jurisdictional and Bypass Issues:

Is regulating non-bypassability of system access charges within states' authority?

_: If we define those who must pay a universal system benefits charge as anyone who takes end-use electricity service off the grid, one confronts two jurisdictional problems. First, do regulators have the authority to apply a universal system benefits charge to the distribution lines? Second, do they have the authority to define the distribution lines (and therefore, those who must pay the charge) to include every end-user of the system? Answers to these questions are also relevant for stranded asset recovery.

_: Some states already collect a wide range of "social benefits" in electricity rates while others don't. For the latter, introducing such charges is a political issue. Any effort to segregate these charges and identify them in consumer billings will clearly trigger a heated political debate.

_: In states where utility commissions do not yet have the authority to level such charges, legislatures can probably grant that authority to them.

_: If you are connected to the system then you have to pay a fair share of these costs. What about new self-generation? What about the non-investor-owned utility companies, which in California serve 25-30% of the customers? ... Given this, the efficiency of fees will have to be examined on a state by state basis as well as a utility by utility basis.

_: Don't forget the Interstate Commerce Clause which has been invoked in striking down some state taxes on interstate business activity as impermissible burdens on interstate commerce. Depending on how these charges are structured and who mandates them, it is likely they will end up in state courts as state authority over the matter is challenged.

_: We ought to persuade FERC to bolster states' authority by providing a functional definition of distribution that describes a new service rather than just a physical definition.

_: The FERC has suggested a multi-part test for determining what is "distribution equipment" for the purposes of cost recovery. Distribution can be functionally defined as a service. FERC also told the states that they can use their authority over distribution to avoid stranded benefits. I hope that the Commission would treat a new service as the critical element of the functional definition of distribution service.

_: Some customers who take transmission voltage already pay state taxes on their electricity consumption. The only real difference between such taxes and the distribution charge is that one is levied by the legislature directly and the other by the public service commission.

Decoupling and Distribution - Utility Willingness to Implement DSM

If utilities make more money by selling more kilowatt hours, won't this profit potential overshadow any support for an access charge that the charge will not be embraced warmly? If performing DSM and renewable activities puts utilities at a competitive disadvantage or hampers their ability to recover uneconomic costs, wouldn't they be reluctant to pursue such activities even with public funding?

_: Decoupling is the answer. With this move, the distribution company would have no involvement with power plants, no involvement with electricity sales. Why would it want its profits tied to throughput? Increasingly, state regulators will conclude that the distribution function should be decoupled. That is, they will decide that profits of distributors should not be tied to kilowatt-hour sales. Once that's done it will be easier to use the distribution charge and align the financial incentives associated with the distribution charge in a way that elicits the desired behavior from the distribution entity.

_: The retail market isn't going to be driven by short-term price alone. As in other markets, customers are going to bring social values to their electricity purchasing decisions. What is going to give you a hand hold in the new world is access to retail customers. Retail customers want the social benefits--look at the Washington Water Power survey (confirming customers' willingness to pay for DSM).

_: How do you prevent decoupling from distorting incentives to minimize commodity costs, run good equipment, and deploy electro-technologies?

- I agree. The answer lies in functional de-integration. The generation business should operate as a commodity business which faces all those incentives. The distributor should focus on its connection to the end-use customer alone and their profits should not be linked to volume of kWh sales. It is difficult to argue in favor of giving the distribution business a piece of the throughput because that is where the United Kingdom went wrong.

_: In the telephone industry, access charges were indeed used to solve the problems and all across the country there are access charge cases where people are clamoring to get those charges down.

_: One reason the telecommunications transition has gone so smoothly is that the sales growth has been phenomenal. This success has basically washed away any stranded investment problems because the number of calls and minutes of use have grown so much that companies have been able to pay off their stranded costs, and for that matter their social benefits --thanks to declining per unit costs, rates and bills. Do we really want to remove from the system an incentive to increase sales?

: Of course in terms of externalities, increasing electricity sales like phone sales is flatly unacceptable ... The telecommunications industry does not have the type of environmental impacts that we are talking about here.

Is an access fee in the public interest? How should it be used?

_: It was said that one must accept the notion that this is an industry "affected by the public interest" or the rest of the discussion doesn't

flow. Many people, however, do not accept this as a starting point. Some people would argue that we should just shut people off, and keep them off if they cannot afford to pay. I think that there is a lot of money to be made in energy efficiency, but these investments take money. What poor people lack is money, so they don't even get to the table.

_: How do you define a cause that's worthy of receiving the revenue from the social benefits charge? Who is going to make that choice and what will the test be?

_: This is not a new question; regulators have faced such issues for fifteen years. The way I would encourage you to answer them is to ask - Is this an investment that helps to minimize life cycle costs of electricity services to society? Low income services are the only program that should apply a different criterion. They draw on a different tradition of equity and essential service.

_: Regulators should continue to make these decisions, albeit somewhat differently. I think history suggests that those causes which are most compelling such as low-income services and renewable energy efficiency investments will be supported. Those who try, for example, to fund the University of California or Pennsylvania through this system should be turned aside.

_: What makes you think that in most states the utilities will get to allocate the money collected through this fee?

Speaker: Historically, that is how it has been done. That is how it should be done now - at least initially. Utilities will collectively embrace this. They will do so because in many instances, utilities are part of a sector that

believes in long term investment for society. For example, Washington Water Power, one of the country's most commodity focused utilities, found that its customers wanted to dedicate a small part of their bill to the public values we have been talking about.

Cross Subsidization

_: A brief comment on the cross-subsidy point: if hypothetical utilities were subject to a price cap, they would have no incentive to engage in cross subsidy because, hiding costs doesn't help you under price cap. Utilities will pursue these profit opportunities only if they think they can make money on them.

_: I beg to differ with that. For example, a regional Bell company who diversifies into a businesses unrelated to telephones will not absorb losses in the diverse identity forever. In the short run, however, to get market position, they may very well set their price below cost in the diversified market and - unless the regulators are careful - use the captive rate payers to fund those losses. They will try to have their cake and eat it too.

_: The entrepreneur is going to capitalize his or her company interests and take losses for the next two years. She is not going to see a profit for a few years, so the idea of accepting loss, while it raises appropriate flags about cross-subsidization, needs to be looked at and protected against.

_: I'm saying that an entrepreneur would love to have his/her losses paid for by someone else.

_: Let's be clear. There are two issues. One is that the company is willing to take losses in its overall income statement ... losses that are

balanced by profits somewhere else. That is not a cross subsidy. A cross subsidy means that they are somehow using costs that are incurred from their competitive business to increase rates in the regulated business. If the company is subject to price cap, it can't do that.

On the Wisdom of Imposing Access Fees

—: I am struck by how limited the first speaker's proposal is. It basically tries to preserve DSM as we know it. Second, I think your emphasis on DSM is perhaps at the expense of the environmental issues. We need to focus on the more fundamental environmental goals we are trying to achieve. While we already have a cap on SO₂, carbon dioxide emissions continue to grow fairly rapidly in the utility sector. You also excluded the possibility of action at the federal level. What about broadening your approach?

Speaker: Broadening my approach is impractical. I emphasized state level action because the primacy of state regulation is a function of history and of the current institutional structure. It is a feature that has delivered some significant benefit. Energy efficiency is the focus because I think it is the largest and cheapest way to achieve large emission reductions. This does not mean that there is not a continuing need for policies to reduce emissions at the federal level, such as emission taxes.

All in all, I want the utility system be a friend of environmental solutions. Having these solutions make good business sense is an ambitious agenda. The fact of the matter is, if you look at the status of renewable, and energy efficiency industries today, it is not good.

Session II. Regulating Performance and Portfolios

The afternoon session of this seminar focused on a number of other proposals for preserving conservation and renewables investment. Together, these proposals could be loosely categorized as performance or portfolio management approaches. They include environmental dispatching, tradeable portfolio requirements, clean fuel tax incentives, and existing source emission caps for NO_x and perhaps CO₂.

The questions that seminar participants were asked to consider included: Which of these ideas might be effective in a competitive world where purchasing decisions will likely be decentralized and direct regulatory control of those decisions will be limited? Are there indirect mechanisms that will achieve the same end? Are these mechanisms politically feasible? How would a PUC implement them?

A number of these issues were addressed in the presentations and discussions that follow.

Primary Speaker:

As with the earlier speakers, I am going to assume our goals are set, and speak mostly about alternative policies to meet these goals. However, I would like to begin with a few words about these goals.

Looking at conventional air and water pollutants, solid wastes, and the full range of environmental effects, the environmental damages attributable to new generation technologies is really quite small. There are four major studies in the United States and Europe that say these technologies produce about two to six mills per kilowatt hour of environmental damages.

To take a different cut at the problem, look at the key environmental effects pollutant by pollutant. For SO₂, we have a national tradeable permits system; as far as economists are concerned, the externalities are internalized because of the SO₂ cap. Particulate emissions from utilities are very small. For NO_x, a major

pollutant, however, one could argue that emissions should be handled in regional ambient ozone transport regions. Therefore the issue of NO_x should be taken off of the electricity restructuring agenda entirely.

With CO₂, there is even a stronger case for the federal government or an international coalition of governments to take responsibility for reducing CO₂ emissions and consequently, to take CO₂ controls out of electric regulation.

I have been asked to talk about four issues: the cap; environmental dispatch; tradeable renewable mandates; and alteration of tax rules.

The Cap

Consider the *Moskovitz cap*, which would permit utilities to recover their stranded investments in return for existing plants being subject to new source performance standards. Utilities could only sell emission credits if they were already at or below these existing standards.

Miscellaneous:

_: One of the points that needs emphasis here is the big **difference between the stranded costs issues which are short term, one-time only, and the stranded benefits issues which are long-term, ongoing issues.** Although it is disturbing that states have not reached a consensus on stranded benefits, some states, such as Rhode Island, have managed to create an environment of pragmatic cooperation in order to move things forward.

_: How do we make the access charge truly a **fixed access charge?** That is when you connect you pay it as a fixed charge, as opposed to a variable charge which is in distribution, which would remove the distortion from the commodity charge.

_: I understand and accept the **economist's justification for a fixed charge.** However, I think that given the amounts we are talking about the distortions are relatively minimal no matter how it's done. I also consider the importance of political realities in this process. It is important to recognize that the design of the charge is ultimately up to the state legislators. These are different from stranded costs, where the size of the distortion matters.

_: The **Michigan Commission recently eliminated utility subsidized DSM,** ruling that DSM is discriminatory against non-participants. Their reasoning was that non-participants benefit from reduced capacity construction, but don't get any of the associated benefits (e.g. fuel savings). We need to find a way to support DSM programs without government mandates.

_: What happened in Michigan could become the norm around the country. Even in today's

regulatory environment **DSM is already being cut.** When these issues go to wider forums like legislatures, these access charges, even for low income subsidies, may not survive.

_: From a utility perspective, the **low-income consumers programs will continue.** Politically they are too important and just don't cost that much.

_: **What actually happens with the money** raised by an access charge will depend in large measure whether you have a revenue cap or a rate cap.

_: Is there a way to create a fund for which people, other than just the distribution company, can **compete via a bidding process for commercialization of new technologies?**

: Is it a concern that some states will establish The stranded benefits fee on the wire, call it an access fee and then lump in a number of things like the New York tax ? **Suddenly your fee goes from 2% to 5% to 40%.**

I like some aspects of this proposal and I don't like others. The part I like is the recognition that there is a new source bias in the existing standards. This means that existing plants are kept around longer because these new source performance standards are tighter and hence more costly - than standards on existing plants. As a result existing sources are kept around longer. You actually get a perverse result that the emissions for the industry could be higher with new source performance standards than without. This might not necessarily be the case, but it is a possible result .

The part I don't like about this is that the solution confuses the ends and the means. What you want to do is set an emissions standard, allocate permits allowing certain levels of pollution and then allow utilities to the trade permits.

Tradeable, Renewable Mandates

These mandates would establish requirements for power suppliers, in a given state, to supply a given percentage of their electricity with renewables, and then these requirements would be tradeable. I'm concerned that in some states the market is going to be thin, and if the point is to give the renewables industry a lift, than I don't see why trading should be limited to one state. Why not introduce national trading? This hearkens back to this morning's theme. Let's identify what we really want out of these programs before we go ahead.

We can compare the tradeable permit kind of approach and the systems benefits charge, which is more of an emissions fee approach, without the incentive properties. The tradeable permit approach provides certainty

over the amount of renewables you will put in place, but you don't have certainty over the cost. I favor the tradeable permit approach because it provides a degree of freedom in allocating of baseline requirements, and you can use that degree of freedom to get companies to buy into the program.

It might be possible to establish a fee that would not be overly expensive. Such a fee would provide an "out" to an utility that could not find renewable resources at a reasonable price. What constitutes reasonableness is a question that will be answered through a political process. There would be an efficiency dimension to the problem, because some firms would not necessarily have to meet these renewable quotas.

Social costing requires some utilities to add an estimate of the external costs of new generation options to their private costs when investments are made. There is a definite new source bias to this approach - i.e. you bring a clean, new source on, but it may be underutilized because of economic constraints. Another concern is the piecemeal problem: the wedge that social costing can drive between electricity prices and other forms of power or energy not subject to similar regulation. With this approach social costing is a legitimate way to proceed.

Environmental Dispatch

If the electricity industry is restructured it is possible that state and federal environmental regulation will change and the cost effectiveness paradigm will fall apart. At this point, there will be growing concern about whether there will be over-control if you allow public utility commissions to use social costing. This concern extends to environmental dispatch as well as to any

scenario in which electricity is dispatched according to social, not private costs.

There could be some interesting efficiency gains in an environmental dispatching system based on meteorological conditions. Dispatch could be altered to capture changes in environmental conditions whether they be favorable or unfavorable. Without a mandatory pool in effect, however, it seems that environmental dispatching would encourage flight of fossil generators and certainly keep out new generators who see themselves as disadvantaged. There must also be an incentive for customers to try to avoid paying full cost prices by bypassing the system.

Taxes

If the renewable energy production credit (a seven to nine mill kilowatt subsidy for some renewables) is ignored, the differences in existing tax burdens across fuel cycles swamp the value of environmental externalities (CO₂ aside). Renewables pay as much as 100% more in taxes of all kinds than fossil fuel technologies. There are two main reasons for this. The first is that generators are allowed to expense fuel costs (in fact, all operations and maintenance costs), capital costs, however, are amortized. Together these two factors create some big differentials.

First Respondent

Portfolio approach

I am assuming we want renewables because of their environmental and fuel diversity, as well as for the related risk reduction capabilities that they may offer, including reducing price volatility.

The choice of appropriate policies depends on

the technologies you are looking at and what it is you are trying to do. In the wholesale market one of the issues sustaining a market for new technologies is simply having a market for them in the short term during the early years of the restructured industry. The possibility of losing momentum during this period for the new technologies is a real problem. Tax credits and access fees cannot overcome the absence of a market. Without a market for power, fees will do you little good.

The portfolio approach offers an opportunity to provide the necessary market. It can be established in hybrid form and will be feasible as long as the cost of the program does not exceed a certain amount over the market value of competing generation options. It is important to have a guaranteed market (even if the markets are small) so that technologies can develop commercially; in this context, getting the most cost-effective technologies to market is important.

There will be some debate about whether the portfolio requirement should be applied to large customers. The American Wind Energy Association's proposal to provide opportunities for trading permits among different suppliers has been well thought out.

The issue is how to enforce a portfolio. This is a problem we could have in restructured markets, namely, consumer information, which affects consumers' ability to compare various supply portfolios and evaluate what is being offered. It will be difficult for commercial and residential customers to have the ability to access the relevant information that will allow them to compare alternatives. Something akin to the disclosures required for mutual funds and would be necessary. Those who sell to end users would need to disclose information on

the following: What are the risks this portfolio faces? How are those risks mitigated? What instruments in the portfolio provide for such mitigation?

There is a whole market sector for whom stable rates may be as important, or more important, than having low initial cost. If customers don't have the necessary information, the advantage offered by renewables and other technologies will not be recognized in the marketplace.

Potential market failures exist that could make it difficult for technologies, already cost-effective on a life-cycle basis, to survive in a market primarily driven by short term costs.

There is a need to be quite specific about the obstacle that need to be overcome.

- 0 If it is the cost of capital and the cost of financing a high fixed/low variable cost technology, we should look at financing strategies.
- If it is the issue of some technologies not yet being cost effective and to further reduce their cost by having a larger market, then some kind of fee or tax credit may be a better strategy.

With any of these options consumer information and the ability to use that information to make effective market choices is a key issue.

Second Respondent

Economic Incentives & Technology Change

I agree with most of the things that our speaker said, and I would like to underscore a few points he made that I think are important. First, we need to separate the economic from

the environmental arguments in favor of these policies. The distinguishing factors of the economic arguments; fuel diversity, general problems with the development of new technology and certainly the tax issue, are not unique to energy.

Rather, these are problems that are endemic in the economy, which economists would interpret in one of two ways. One way is to say that "all the theorems we use to analyze markets are not only wrong in energy, they're wrong everywhere. So maybe we should just shut up." This won't happen. Another way is to consider whether these problems are any worse in the energy sector than in the economy at large. Do we as public policy makers really want to pursue solutions to these particular problems?

There are many examples of difficulties in getting into large markets initially. Fifteen years ago there was no such thing as a personal computer; now look at what has happened. The electric utility industry is not an inherently small market. When you recognize this you realize that there are a lot of players who may have incentives to invest money in these technologies.

Environmental Dispatch

Regarding environmental questions, I have several comments on the different proposals. One thing that really jumps out of the *Harvard Study of the Environmental Impacts of Restructuring* is the importance of rescheduling how power gets generated from existing power facilities. This seems to have a much larger environmental impact than anything one might do with renewables or DSM. This observation suggests that something like environmental dispatch or other policies determining which plants run is clearly

where the action is.

I don't see any reason why the Poolco could not have different bids for power that had different environmental impacts. It may be complicated but I don't see why the coordinator could not be clearing the market; offering, taking, and choosing bids that are different for power that has different environmental consequences.

Portfolio Approach

A brief comment on the portfolio approach and the general issue of tradeable renewable mandates. Ten years ago policy makers were not paying much attention to economists' arguments about the economics of regulation. Now we're in a world in which it seems that whenever there is a problem, the solution is tradeable permits.

Alternative Fuels Mandate

There have been proposals for an alternative fuels mandate. Every refiner would have to sell a certain fraction of non-fossil based fuels. They would of course, be able to trade it. Trading is a good way to facilitate our objective. However, we should not be fooled that trading is necessarily *efficient*. We have to return to the question of whether the mandate is accomplishing an objective that we all agree passes some sort of generic, subjective social benefit cost test and so is worth doing. As we said this morning, consumers will vote with their dollars and will make their own decisions about what kind of power they want to buy. Regulators won't have to get involved.

Discussion

Do current emission caps negate the need for externality charges on SO₂ and NO₂?

_: Is an SO₂ externality from coal plants a reason why society should be doing something more to encourage renewables? The answer is no, because if we built more renewables, all that is going to happen is somebody somewhere is going to produce more SO₂ from some other plant.

_: The major source of particulates in the atmosphere today is really SO₂ and NO, But they are secondary, not primary pollutants. Simply because we have a national cap on SO₂ emission, one that is related to the cumulative loading of acid deposition on our forests, does not mean we've internalized anywhere close to the total cost of the externalities associated with SO₂ emissions from power plants. We have not even looked at particulate matter (i.e., under ten microns) which is currently unregulated. According to the latest health literature, this is the leading cause of mortality from air pollution.

_: New regulations for SO₂ are in the making. It may be that all we are talking about is the definition of an externality versus some future cost that has not been recognized in current rates. There may be some distinction you want to make there, SO₂ is not off the table.

_: So the policy implication is that even though you have the cap, the externality charge should still be applied.

_: If you accept the level of reductions required to meet in the SO₂ cap, it is not necessary to add externality charges to that in order to achieve that level. To the extent that the externality charges are less than the value

of the tradeable permits, it's strictly a wealth transfer and it has no impact on efficiency. To the extent that the charges are greater than the value of permits, they produce reductions below the level of the cap.

S and Regulatory Risks:

_: What happens if you believe that because of the fine particle and sulfate issues, that the goal of reducing ten million tons per year of SO₂, is the wrong number, that we know it will be eight in 1999?

_: As a utility planner the value to you of reducing your SO₂ emissions might be greater than what it appears from just the immediate benefits you receive today. In order to derive a public policy argument that encourages renewables, you have to assume that policy makers know more than the utility planner about what will happen in the future.

_: Your logic is the same logic used to set CO₂ requirements. This is simply regulatory risk, the risk that in the future the feds will set some CO₂ standard and you might get stuck with some high CO₂ investment.

Environmental Dispatch and PoolCo Structure:

_: Can we have environmental dispatch with a non-mandatory pool?

_: The logic of PoolCo is that joining the pool will be attractive because of economies in providing network services. Once you add environmental costs to the grid, however, won't you have a number of people leaving the pool?

_: If you charge environmental externalities to

some and not others, I want to be in the "not others" category. The pool mechanism does not solve this problem - the only problem the pool mechanism solves is all the *network externality* problems associated with the interconnected electrical system. It does not deal with those who want to leave the grid; this has to be addressed in separate legislation.

Can/Should Performance Standards and Portfolio Requirements Be Made Non-Bypassable?

_: What about generators outside the region? Would an arrangement be made under which in order for sellers to sell into the region they would have to surrender allowances or be dispatched as if they were surrendering allowances?

: Wouldn't it make more sense to let the individual states make their own decisions about caps and when a generator is thinking about exporting, it will have to take into account that any export may be constrained by a state cap.

_: To take an example, Ohio may well make a decision based on local interests, and neglect the interest of New England. This might cause emissions in New England to go up because it is downwind of Ohio, where emissions are much higher.

_: That is an environmental regulation problem, not a utility regulation problem.

_: The interesting question here is, is there a way to construct a subterfuge? That is, if Ohio won't cooperate, the system will penalize them. I don't think such a system is impossible to create, but it's harder to imagine.

_: In any new competitive market, we will need to create a level environmental playing field, that is all actors play by the same set of rules. Power pools seem a logical place to start. In addition, problems associated with the initial allocation of emission rights can be solved by actually vesting permits in the system operator. Give all permits to the operator, then acquiring them becomes an additional ancillary cost of doing business. The generator who has a cleaner facility has to buy fewer permits from the system operator than the guy who has dirty plants.

Should Dispatchers Be Relied Upon To Implement Standards?

_: Do you think that the utility industry or regulators would want to place a significant portion of the burden of enforcing air pollution regulations on the grid dispatcher?

_: That will complicate the dispatcher's job considerably, which will be complex enough as new players are added to the system.

_: I agree that is the Achilles's heel of such a system. I can imagine, however, a system where the utilities are begging for environmental dispatch, that is a system of episodic controls to meet clean air requirements. The EPA is talking about the episodic controls approach, in which certain controls would kick in on a day-to-day basis. Environmental dispatch is a perfect vehicle for imposing episodic controls. It saves the utilities millions of dollars, so they want a system in place.

_: But how do you "impose" that cost?

_: If the dispatcher has a performance target, the dispatcher is the one entity that is in a

position to flexibly respond based on what she sees being bid into the system.

Bilateral / PoolCo Compatibility With Environmental Controls:

_: What happens if there is a combination Poolco and bilateral system, and I have, say, a 100 MW must-run plant. The dispatch is based on the price of the contract, and the dispatcher has no control of individual plants. What happens when you have a constraint?

_: It does not matter if you have a cap. That plant is subject to the cap like everyone else.

_: What happens if the power is from a plant outside the pool, say, in another region?

_: The first -order problem within a given pool, is whether there exists an equivalent voluntary pool in which an emission cap is imposed and people voluntarily incorporate combined economic/environmental dispatch.

I think that the people will voluntarily incorporate dispatch. Even in a voluntary pool, the operator will know what the flows are, since the operator will have to penalize generators for not providing power according to bid.

_: Doesn't that depend on the existence of a bilateral contract?

_: No. If there was a cap that specified that NOx emissions in New England cannot exceed X, and we allocate rights and allow trading, then every generator in New England would have to have a permit equal to the amount of NOx that they were actually going to generate. When signing a bilateral contract or declaring themselves as "must-run" for example, they

would have to take that into account.

_: I agree that there is a need for a non-by-passable dispatch system in order to implement environmental dispatch. However, if there was a hybrid system, how would future contracts work for clean generation? I can imagine scenarios in which charges are assessed, renewable get billed, etc. but they are never dispatched because they are not the marginal plant.

Feebates:

_: A pool could support a revenue neutral fee-bate system that does not affect the market clearing price, but at the same time pays a premium for generation that produces less pollution. Such a system would gradually shift the generation mix towards less polluting plants.

_: If the adjustment is done ex-post, then you are not implementing environmental dispatch. The adjustment must be made before the marginal plant is determined otherwise the goal of shifting generation away from dirty plants toward clean ones is not achieved. In general, you will affect market price.

_: How could that not affect the market price?

_: It depends on how you implement the fee-bate system. If you implement it before determining the winning bidders, what the pool actually pays to the suppliers is adjusted based on pollution.

What Are The True Cost of Environmental Externalities?

_: What are the four studies on electricity - related environmental externalities that were

mentioned earlier? I'm curious to know what accounts for their much lower externality (two to six mills/kWh) compared to those figures adopted by Massachusetts, California, and Nevada, which were five, ten times higher.

_: Oak Ridge and RFF did a study on new sources and CO₂ - it was funded by the Department of Energy; another was the New York state externalities study. Triangle Research Institute did the Northern States Power Study; and the finally the European Community did a study which paralleled the DOE/Oak Ridge effort.

_: Is the assumption behind those numbers that if you have a regulatory emissions cap that the externality costs are zero?

_: No, it was not treated definitively as zero. There are numbers provided that would assign it to be zero, and then there is another algorithm for trying to take into account where the increases and decreases in SO₂ might be.

_: Do the four studies take into account the two recent long-term studies on particulates the *Harvard Six Cities Study* and the *Cancer Society Study*, which suggested that the chronic particulate impacts are considerably higher than the acute particulate impact?

_: It does not take into account the long-term, ten- year study on particulates.

_: There are two long term studies. The particulate effects on mortality follow the body of literature by Joel Schwartz on this. The *New York Times* ran a story saying that cutting particulates to zero would save 66,000 lives per year; I think that this is on the outer edge of plausibility.

Miscellaneous

—: The overarching question in my mind is, with a restructured utility industry, **have we changed the ability of states to be laboratories of democracy on environmental pollution?**

—: We recognize that while both renewable energy and energy efficiency offer reduced air emissions, if your *goal* is indeed reducing emissions, neither one of those two alternatives would be the first choice for doing it. **We ought to be much less concerned about any new source of generation that would come on than about retiring the vast fleet of existing and aging power plants in the eastern United States.** History has shown us there is a reason to be cautious. Look at the 1970 Act - if they had done what the drafters thought, all the generation from the 1970s would be retired by now. That has not happened.