

## **EBA CLIMATE CHANGE PRIMER: CAP AND TRADE**

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### MODERATOR

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MODERATOR: Good morning everyone. My name is Bill Westerfield. I practice law for Ellison, Schneider & Harris in Sacramento, California and I'll be moderating the first panel and I would like to welcome you all here for the much anticipated carbon regulation panel on design elements for a national cap trade system.

Before we get started, I would like to first of all recognize some of my colleagues on the renewables committee this year. Monica Schwebs, my co-chair, Gearold Knowles, the vice chair, Lynn Fountain, Jim Ruben, and a number of other Renewables Committee members who have been very generous with their time and just a pleasure to work with. So, thank you all very much. And also I would like to mention a few logistics. We will be taping this panel for transcription in a later edition of the Energy Bar Journal so I remind the panelists to enunciate as best they can and speak clearly into the microphones and especially during question time. As for questions from the audience, we ask that you go to the microphone with your question, or if you like, ask for a microphone where you sit and speak your question into the microphone. This way we can accurately record your insightful questions. Also, some of our presentations did not make it into the materials today so if you would like a copy, we can make those available, just please see Marlo Brown or Lorna Wilson and they can make arrangements.

Before I introduce our speakers, I would like to make just one comment on my point of view. In yesterday's excellent panel on the prospect for national carbon legislation, I heard that there are still members of Congress who think that global warming is not a big problem, not a big deal.

Well I think it is a big problem. It is the biggest problem that we will face as a civilization in our lifetime. It is not just my opinion but the opinion, no the consensus, of the world's leading scientists that warming of the climate is unequivocal and that we are in a crisis now. I suggest if you want to scare your socks off, take a look at the Synthesis Report of the Inter-Governmental Panel on Climate Change, Fourth Assessment Report. Its warnings are very, very profound and dire. So, the time now is for action and the debate should center on how to take that action. We have a great deal of consensus now that cap-and-trade will be the consensus approach and so now it is a question of how we construct that. Today, we have four very knowledgeable speakers on how to craft cap-and-trade legislation to help us to think through that question.

Our first speaker will be Brian McLean. Mr. McLean is Director of the Environmental Protection Agency's Office of Atmospheric Programs. His office has a professional staff of 250 and is responsible for designing and implementing emissions cap-and-trade programs such as the Acid Rain Program and the Clean Air Interstate Rule. His office is also responsible for developing EPA's voluntary climate protection programs and for analyzing climate legislation and supporting domestic and international climate policy developments, as well as for implementing the stratospheric ozone protection program under the Montreal Protocols. Previously, Mr. McLean served for twelve years as Director of the Clean Air Markets Division, which develops and manages market-based emissions reductions programs. Mr. McLean has been at EPA since 1972, and he was a key contributor to the development of Title IV of the 1990 Clean Air Act and the Acid Rain Program. He holds a Bachelor's Degree in electrical engineering from Lafayette College, a Master's Degree in City and Regional Planning from Rutgers University and a Doctorate in City Planning from the University of Pennsylvania. Brian will start by discussing the U.S. experience and lessons learned from two very successful cap-and-trade programs, the Acid Rain Program and the NO<sub>x</sub> Cap.

Second up will be Dr. Dallas Burtraw. Dr. Burtraw is a Senior Fellow at Resources for the Future. He holds a Ph.D. in economics and a Master of Public Policy from the University of Michigan. Dr. Burtraw has a long-standing interest in the design of incentive-based environmental policies in the electricity industry and has authored extensively on the performance of emission trading programs in the U.S. for sulfur dioxide, nitrogen oxides, and European Emission Trading System for carbon dioxide. He currently serves on the EPA Advisory Council on Clean Air Act compliance analysis and on the National Academy of Sciences Board on Environmental Studies and Toxicology. Dallas will discuss the efficiencies and distributional affects of different methods of allocating allowances in the electricity sector.

Following Dallas will be Franz Litz. Mr. Litz is a Senior Fellow with the World Resources Institute. He's currently engaged in advising the Western Climate Initiative, discussed this morning, which is a group of Western States and Canadian Provinces for developing an economy-wide cap-and-trade program. He's also a part of the WRI team informing the climate debate in

Washington. Before joining WRI, Franz served for four years as the Climate Change Policy Coordinator of the New York Department of Environmental Conservation. There, he served as New York's principle representative to RGGI. During the first three years of the RGGI effort, Franz chaired the multi-state working group designing RGGI and was instrumental in bringing the states, the Northeast states, to consensus around RGGI decisions, and I'm sure that wasn't easy. He served as a principal author of the Memorandum of Understanding executed by the regions' governors in December 2005 and was a principal in drafting the RGGI model rule. Prior to his service in New York, Franz practiced environmental law with Brown Rudnick in Boston. He's a graduate of Boston College Law School and is a graduate of Union College. Franz will address current debate on how state regulation fits into a potential federal scheme.

And at the end of the podium, last but certainly not least, is Jeff King. Paul Ezekiel of Credit Suisse was scheduled to speak today. He could not come and so Jeff has graciously agreed to step in for Paul. Jeff is based in New York City. He works on the Carbon Emissions Trading Desk for Credit Suisse. He focuses on financial structuring for carbon origination transactions in developing countries. His main responsibility is to source carbon credits. Jeff previously worked in Credit Suisse's investment banking division where he closed mergers and acquisitions and financing transactions in the oil and gas sectors. Jeff will present the carbon trader's perspective on cap-and-trade issues.

So without further ado, Brian. Thank you.

MR. MCLEAN: Okay. Thank you. Thank you Bill. When I accepted this invitation, it is with an issue like this, I should say that it's always changing. It's sort of difficult to anticipate where will you be when you actually speak on this issue as opposed to when you accept the invitation, and when we were talking about this a few weeks ago, I thought some of the issues on climate would be a little bit further along than they actually are although the deadlines we have in front of us are still there. Yesterday, you heard where things stand with Congress or views of people on legislation.

I just wanted to say a couple of things with regard to the administration currently on climate change. We do expect a decision on the California Waiver very soon. We had committed to make this decision by the end of the year and we're getting close to the end of the year. We also expect a decision on a proposal on regulating greenhouse gases from autos and light trucks. The President made this a goal in May when he said that by the end of the year, we would also have a regulatory proposal dealing with automobiles. In October, a little over a month ago, we announced, EPA announced that we will propose by next summer regulations addressing geologic sequestration of carbon dioxide under the Safe Drinking Water Act that EPA is responsible for. And that's a critical technology for advancing reductions in CO<sub>2</sub> from major combustion facilities.

And taking this into account, we're also quite aware of the potential implications of these decisions, both the court decision going back to April and the decisions we'll be making in these other areas, on regulations of stationary sources, which was mentioned earlier this morning under the Clean Air Act, and I would expect that there will be more discussion as to the implications of the things I've pointed out as they relate to stationary sources over the next several

months. So today, my presentation is going to focus on how we have regulated sulfur dioxide and nitrogen dioxides through the cap-and-trade mechanism and how it can provide some insights into how, if we were asked, we might use this mechanism to address greenhouse gases.

Cap-and-trade is one of several regulatory approaches. I say that because some times people think it is the only way to do things. There are many ways to address a particular environmental concern, even in the air arena, and cap-and-trade is one of them. If properly designed and applied, it can be both environmentally effective and administratively efficient. It can reduce emissions quickly and cost effectively and it can promote innovation. It goes without saying, if it is not designed correctly, it will not do any of those things very well. It works best in situations where the aggregate impact of the pollutant that we're concerned with is of principal concern as opposed to narrow individual source impacts. It works best where there are cost differences across sources, and where you have existing strong regulatory institutions and financial markets.

And we've applied this very well in the United States because of all three of those reasons and when we work with other countries, sometimes the regulatory institutions and financial markets are not as well developed and so it makes it more difficult.

This approach can also work in concert with other regulatory approaches if it is thought through; if it is done thoughtfully, it can do that. Just briefly on acid rain. On this slide is the situation, for wet sulfate deposition, which is the predominant component of acid rain. This is what the situation looked like around 1990 when we passed the Act. There were high concentrations throughout most of the East, particularly in the Northeast quadrant of the U.S. This slide shows the location of power plants around the U.S. Power plants were responsible for 70% of the SO<sub>2</sub> in the United States so it was clearly the dominant source and the focus of regulatory attention. Coal-fired power plants, as you can see, are 95% of the SO<sub>2</sub>, 90% of the NO<sub>x</sub> and 83% of the CO<sub>2</sub> from that sector.

The legislation that was established in 1990 set a level of a cap and a declining cap over time. It set the timing, the dates by which these reductions were to be met and it specified how the allowances, which is the authority to emit, would be allocated across sources in the program. The allocation was not seriously addressed until the cap was basically agreed to. There was an understanding of what level of emission reductions were desired and then people started talking about how to allocate the responsibility for meeting that reduction. That's an important distinction because if you start with the allocation and you don't know what the cap is, you will eventually end up with a pretty weak reduction. What we found in the legislative process is that the natural tendency to always ask for more allowances is there and in fact, Congress did over allocate, but they put a provision in the statute which directed us at EPA that if they in their wisdom, over allocated, we were to ratchet back to the level of the cap so that we guaranteed the reductions under the program. So it was a very important feature of the program.

Distributing allowances is probably of most interest to the companies involved and will be of most interest to many of you, and Dallas, fortunately, is going to spend most of his time talking about this issue, so I'm not. But I would say we've had experience in several different approaches. They each have their

plusses and minuses. We've done direct allocation to sources using different methods. We've had a small auction, not a major revenue raising auction. And there can be combinations of these different approaches. The allocation, we believe should balance the need for certainty, that is, you want to provide some predictability to the industry involved so they know what the obligations are some distance in the future so that they can make investment decisions appropriately, but you also want to recognize that circumstances may change over time and you want to be able to adapt to that. So there's tension between those two.

The progress we've made under this program is most clearly demonstrated by a map like this, which shows where we were in 1990 and where we are as of the last few years. There's been a substantial reduction in wet sulfate deposition across the Eastern United States which is one of the reasons this program has been viewed as such a success. That in a relatively short period of time, it has produced the results that it was intended to produce and we have been able to measure, on the ground, the impacts of this program. The second reason this program has been viewed as successful is because the cost of the program came down substantially from what we thought it was going to cost, for a variety of reasons. The cap-and-trade program is not the only reason costs were lower than expected.

There were a number of other things going on in the economy, but the cap and trade approach took advantage of those changing economics and drove the cost lower.

Originally, we thought the cost was going to be more in the \$7 to \$8 billion area per year (in today's dollar), but it's actually been closer to \$2 billion per year.

It's a very substantial cost savings to the industry and to the economy. One of the issues that arises with trading, (this is not an issue in the climate change debate, but in most of the other pollutants that we deal with) is spatial. Will there be hot spots? Will emissions rise certain areas where we don't want them to rise as a result of trading? This issue has been analyzed pretty extensively with regard to the SO<sub>2</sub> program since it was the first one to really embrace this approach on a nationwide basis and it was looked at by the Environmental Law Institute, by Resources for the Future, as well as Environmental Defense and all of them found that in this case, we did not see creation of hot spots. In fact, because economics worked correctly, that is the areas with the largest emissions also happen to have the most cost-effective reductions, we tended to see the reductions where the emissions were highest. So it sort of reinforced the improvement where we wanted it to be made. We also had a backstop in this program in that we left in place the requirements that, or the opportunity for state and local governments to establish emission limits if they found that emissions were too high in local areas. So, although we left that insurance policy in place, it actually was not needed. Nobody has made adjustments in response to trading. It also ensures that local facilities will not create local problems.

Turning to NO<sub>x</sub>. NO<sub>x</sub> was different in several respects and again it was a slightly different experiment in using this approach. First of all, ozone is created by two pollutants, NO<sub>x</sub> and VOC. Ozone also, has local components as well as transported emission components to it. The power generation sector which is the predominant part of this program also was only about 25% of the NO<sub>x</sub> problem,

which was only one of the two pollutants responsible for ozone, so we were dealing with a much narrower contributor to the problem. The question would be, could this still be an effective tool to use to deal with this problem?

And lastly, we were focused primarily on summer season emissions. In the Acid Rain Program, it was year-round emissions. In this case, we were concerned mostly with the summer season. This map shows the area of the country that's been the focus of the NO<sub>x</sub> reductions. Programs started in the Northeast with a program in the mid to late '90s which we expanded to encompass most of the Eastern U.S. It focused on electric utility generators, but it also incorporated industrial boilers and set a goal of reducing emissions by 70%. Again this was a five month program instead of an annual program. It applied to industrial boilers as well, which was a test to see whether we could go there. The distribution was done a little differently. We distributed allowances in the form of an allowance or an emission budget to each state and then the states in turn reallocated to the sources within their state. One point under allowance use, which was a little different because of the seasonal aspect and concerns about the temporal quality of this pollutant, was a nervousness that we might be allowing emissions to be just as high on the hottest days and people would actually reduce their emissions on the cool days when it didn't matter. And so there was a provision called progressive flow control incorporated to try to limit the use of banked allowances so that they didn't contribute to a problem in a temporal sense. So this was an extra sort of complicating feature in the program. Monitoring and reporting were very similar to the SO<sub>2</sub> program. Compliance and enforcement was also very similar. The penalty was structured a little differently for the nature of this program but it served a very similar purpose in that it was rather automatic in its application and predictable. Regarding the results here, first of all on the left-hand side of the slide, it gives you a picture of the emission reductions that occurred for the sources involved in this program, from 1990 down to 2006, the last year that we had produced data on this. The emissions reduction has been over 70%. So we have accomplished the goal we set out to accomplish and again in a pretty short period of time.

On the right-hand side of the chart is this temporal issue that people were concerned about. Would the peaks still stay the same? That is would we just lower the troughs and not lower the peaks and if you look at the red line on the top, that was the year 2003 when the Midwest was not yet in the program and then the next three lines are 2004, 5, and 6 and you can see what happens. Emissions came down both in the peaks and the troughs. The overall seasonal emissions dropped, so when we modified this program to expand it to the Clean Air Interstate Rule which is a slightly broader program and requires an additional reduction, we actually dropped the provision for progressive flow control. We felt that the complexity of it was not proving to be necessary to deal with the temporal aspect of the program. So we moved to a little bit of simplification.

The affect of this program has been to reduce ozone in the Eastern United States such that today relative to just a few years ago, 80% of the areas in the East that were not attaining the air quality standards for ozone are now attaining the standards, which again is a rather dramatic improvement. We've also had reductions in mobile source emissions during this period of time and they are the second largest contributor to NO<sub>x</sub> and ozone. So we've had the beneficial

impacts from that too contributing to this reduction. The Clean Air Interstate Rule which is the follow-up to both the Acid Rain Program and the NO<sub>x</sub> program is expected to further reduce emissions.

One of the interesting things is that the total cost of this program, plus the Acid Rain Program will equal what we thought the original cost of the Acid Rain Program alone would have been. That is the total cost of all of these programs now will be in the \$8 billion per year range which is what we had thought the Acid Rain Program alone would be. And the benefits have been tremendous. If you look at environmental programs, the annual benefits of these programs together will be, by 2020, in the \$350 billion range relative to an annual cost of closer to \$8 or \$9 billion. So it is a tremendous cost benefit number. There are four basic elements of these programs that we have found to be necessary and there are many, many variations on the themes. The first one is that if you include a sector like power industry or pulp and paper or whatever, you should include the whole sector. If you don't, you risk "leakage," where people, particularly in the power sector can shift power production (and emissions) to facilities not covered. So we feel that's important to the extent that it can be addressed.

The second area of course is the cap. The cap is not only important for environmental reasons, but it also provides some certainty to the allowance market, to the market side of the program. Monitoring, the third element, is essential in this program. We have to know what people are doing because, not only again for environmental reasons, but to maintain the integrity of the allowances that are being traded so that we have a very certain understanding of what is going on. If we do the first three things, if we include the whole sector, if we put a cap on emissions, and we monitor, then we have the flexibility to allow unrestricted trading and bad banking and allow the market to drive the cost down in the program.

On emission measurement, I just want to say that one of the fears is that this can be expensive. We've applied the more expensive technology to the areas where we get the most air emissions reductions that we are accounting for. So that's turned out to be one of the important things as we make all the information publicly available. So you can go to our website and you can see the hourly emissions of every power plant in the United States. You can see it for SO<sub>2</sub>, you can see it for NO<sub>x</sub>, you also can see it for carbon dioxide which is required under Title IV. So in terms of preparation for any climate program, we already know what the CO<sub>2</sub> emissions are from every power plant in the U.S.

The allowance market has been quite active. We didn't know how big it was going to be when we started, but we wanted to facilitate whatever trading and cost reduction could occur and this is the pattern. We've automated it over time and now 98% of the transfers that occurred are done on line. It's like PC banking so people can go in and they can make their transfers. There's no government approval of the trade. There's no time delay. It's instantaneous and that has made the program economically viable, and again we make all the trading transactions available too. So there's transparency there.

The one lesson learned that I wanted to leave with you is the importance of the focal point for the government. You'll hear from other panelist about other perspectives but I can speak most directly about the government role. Achieving the environmental goal is the primary purpose for which we set up these

programs, reducing and capping emissions, and we've done it with more than 99% compliance which is tremendous and better than almost any other program that we have. The second thing we do that is important is supporting the allowance market, and somewhat facetiously I could say, by staying out of it. A lot of people want to meddle and design and fine tune a market. I don't think that's the government's role. With regard to market operations, I think our role is to establish the integrity of the allowance that's being traded so that people have confidence in it; to provide transparency of the data; and to minimize the transaction costs and administrative costs for both the government and the industry.

Thank you.

MR. BURTRAW: Good morning. I'm Dallas Burtraw and I'm going to talk about the allocation question, both efficiency and distributional affects and I'm going to focus on the electricity sector because, it's especially important. The electricity sector is responsible for about 40% of the carbon dioxide emissions in the nation but most modeling suggests that the electricity sector would be responsible for about two thirds to three quarters of the emissions reductions that would be achieved over the first couple of decades of a strong climate policy in the U.S. You have already been to the basic idea of cap-and-trade in a couple of talks already. There's an emissions cap that limits the quantity of emissions and allowances the right to emit a ton of the emissions. The annual distribution of allowances would be worth billions of dollars and the question is should that allocation or initial distribution of emission allowances be done for free and on what basis and to whom or should potentially other mechanisms such as an auction be used.

This graph is meant to focus your mind on the importance of this issue when we think about CO<sub>2</sub>. The annual asset value that is created from the intangible property right under the NO<sub>x</sub> and SO<sub>2</sub> trading programs are in the order of \$2 billion a year or so. That is, this is a value that previously did not exist until the government stepped in and said it was going to enforce a property right in this area. The value of the property right under an economy wide CO<sub>2</sub> program would be about 100 times that. It is quite enormous even in the electricity sector alone. Represented here is a very modest program only in the electricity sector, which would still be on the order of \$50 to \$60 billion a year that would be distributed every year. You can think of this as analogous to the opening up of the great American West and the distribution of initial property rights two centuries ago. It's going to be one of the greatest government creation of a new market that we have seen. Economists get very concerned about this allocation question because it can have enormous consequences for the efficiency of the cap-and-trade program. Different approaches to allocation can raise the cost, at least within the context of an economic model, by a factor of two or three compared to what efficient allocation would achieve. When does that matter? Without getting into technical issues, what's at stake is when prices differ from marginal costs throughout the economy. For example, economists are always critical of new taxes because new taxes are a drag on the economy. They impose a wedge between what workers receive for their effort and what their actual opportunity costs are for their effort and so any type of new regulation that imposes a cost on the economy does something similar.



Economists have pointed to the use of an auction, or alternatively a carbon tax as efficient approaches because they create a lot of revenue and that revenue can be used to reduce pre-existing taxes. The disadvantage of these types of approaches is that the full potency of the economic instrument would be felt in a change in product prices. So while it is economically very efficient, it has this one political disadvantage and that's the crux of the political economy of the debate.

There are other reasons why an auction type of approach is advocated by economists and environmental advocates and that has to do with the fact that the auction revenue might be used to reinforce program goals. Also, it is widely viewed as administratively much simpler than say, the beauty contests type of approaches where there's allocation based on some sort of administrative findings and then there's a lot of effort spent in trying to establish claims for that entitlement. The academic advice is as close to a consensus in the economics area as we now see emerging in the science literature with respect to the impacts of climate change. The economic literature broadly finds that there are significant efficiency advantages to auctioning emission allowances. So why give any emission allowances away for free? Well, the public policy literature and the economic literature suggest that there are some reasons why you might want to. One is as compensation, perhaps to direct compensation to those firms that are directly or indirectly affected by the climate process. However the free allocation of 100% of emission allowances can dramatically overcompensate those industries, and this is what creates the so-called windfall profits that has been a criticism that's been levied against the first phase of the EUETS, where well over 95% of the emission allowances were given away for free. And secondly, it is worth noting that at least in the electricity sector, consumers are going to bear eight times the cost of that borne by producers or emissions and shareholders of the companies that own those firms. It is consumers that are most directly affected.

Other reasons for free allocation might be to promote specific technology or to protect industries that are exposed from foreign competition during transition to a broader climate regime internationally one day. I want to note that all these goals could be achieved with auction revenue, so it does not necessarily require the entitlement of emission allowances. We could set up programs in which compensation or promotion of technology or protection of competition was achieved with auction revenue instead of with free emissions allowances directed to various entities in the economy.

The difficulty with the allocation decision in the electricity sector, the issue that is the elephant in the room, I think, is that there are tremendous regional differences in the electricity sector and this is posing a huge challenge to federal policy. Let me explain. In general firms are compensated in two ways under a cap-and-trade program. One can be through free allocation of emission allowances and the second is through the change in the product price. The dilemma is that there is a big difference regionally in the electricity sector because roughly half the nation has traditional cost of service ratemaking for establishing electricity prices within a regulatory framework and the other half of the nation has competitive based prices. The way that these two mechanisms work is very different, and therefore the way that electricity prices would be affected under a cap-and-trade program is very different.

I have one slide with a couple of equations on it but if you master this slide then you will have a grasp of the major issues defining regulatory treatment in the electricity sector and how it interacts with climate policy.

So think about total cost for delivering electricity services we would include a number of things such as capital costs, fixed O&M, fuel and variable O&M, and if there's an auction, total costs are increased by the value of the pollution allowances that you have to pay for through the auction. Total costs is represented in dollars. Variable costs which provide the ordering over which generators are dispatched to provide electricity services hinge on only fuel and variable O&M and pollution allowances whether there's an auction or whether you've achieved or acquired those emission allowances for free. Why is that the case? Because there's an opportunity cost associated with using emission allowances regardless of how you acquired them in the first place because there is a secondary market. If you have to be true to your shareholders, you have to tell them you're minimizing costs and maximizing the value of the company. The company owns this asset so it would only use them wherever it is economically most profitable to do so. The company can either sell them on the secondary market or use them for electricity generation, and therefore the opportunity costs get rolled into the calculations of variable costs for electricity generation. The electricity price, in terms of the dollar per megawatt delivered in a regulated region of the country, is, roughly speaking average costs, which is simply total costs divided by production. Under an auction, total costs include the original cost paid for emissions allowances. So the price of electricity is going to be greater under an auction than under grandfathering (free allocation) of the emission allowances. That's the key thing to keep in mind. But in competitive regions of the country, price is determined, roughly speaking by the variable cost of electricity generation and that variable cost includes the opportunity cost of emission allowances. So in that case, the price is the same under an auction as under grandfathering. That's the difference and so you have the nation divided in half with two different approaches and two different prices resulting not only because it is competitive versus regulated regions of the country, but the way that cost recovery rules govern the recovery of allowance costs.

Since regulators in regulated regions of the country are thought to treat all costs in a manner that will keep shareholders whole, at least in the long run, then we're going to assume that they set prices in a way that recovers allowance cost at original costs. Now take a look at what happens in competitive regions in the country and you see there's a lot at stake here with regard to whether allowances are allocated up stream (or equivocally as an auction in the economy because either way it appears as an auction to the electricity sector) versus if there was free allocation to generators. Across the bottom of this graph is the change in the value of firms in terms of dollar per kilowatt of capacity of firms in the industry in competitive regions of the country. This graph is for the somewhat now out of date National Commission on Energy Policy proposal which was the original Bingham proposal, a moderate approach to climate policy. Under free allocation to generators, in competitive regions of the country, since they receive this allowance for free and they turn around and put it into the variable cost when they bid into the wholesale power market, then they get compensated both through free allowances and through charging consumers for the opportunity

costs of using those allowances and that is the origin of the so-called windfall profits. You see in the red bars under free allocation virtually all of the capacity in the country realizing a net increase in value, when organized at the firm level. Under upstream allocation, under or under an auction, however, then you see sort of an even split with a lot of firms suffering an instantaneous loss in value. Coal-fired power plants would realize a loss in value, but other assets, including nuclear assets, efficient natural gas plants, and renewable assets would realize an increase in value even then. Firms own portfolios of generation assets that determine how they will be affected.

This next picture shows what's happening under different regions of the country. The dark blue is the electricity price in the base line, in the absence of a policy, and the light blue represents the change in that electricity price. The mountain that grows from left to right represents the use of coal for electricity generation in different regions of the country. The message I want you to take out of this picture is that greatest increase in price will occur in regions that have historically the lowest electricity prices. From a national perspective, this is a fortitudinous result unless you live in those regions of the country that suffers a price increase. This is because those regions of the country that suffer a price increase would be expected to still have the lowest electricity prices anywhere in the country even after the addition of climate change, but you do see that different regions of the country are going to be affected very differently under climate change.

I'm going to have to skip ahead in the interest of time and I want to show you now what's happening on an economy-wide basis under the more rigorous McCain-Lieberman example, which has now been yet supplanted as Brian said by the Lieberman-Warner Bill. Under the McCain-Lieberman example and under an auction, this graph shows the change in electricity price that would be expected in the year 2015. The blue represents competitive regions of the country and it is amassed by the amount of electricity sales. That's what the vertical height represents in those regions of the country. The units are missing from the vertical axis and but they are billions kilowatt-hours. The red represents regulated regions of the country and what's somewhat encouraging about this picture is that at least it's symmetric between those regions in the country that have different types of cost recovery rules and what differentiates regions is the coal intensity of electricity generation. The greatest change in the electricity price occurs in those areas to the right in this graph, which are those areas that already have the lowest prices. So that's sort of good news unless, as I note, you happen to live there.

Under free allocation to generators, based on emissions, we get this asymmetric divide. Some people refer to this as basic grounds for a new civil war from a regulatory perspective because regulated regions of the country would experience relatively little change in electricity prices but competitive regions of the country would still experience this large increase in electricity prices, blue being competitive regions of the country. This has been one of the focal issues for two or three years among agencies and among consultants and among the companies across the industry, and the different elements of industry bash heads trying to figure out what would be a reasonable way to go forward with climate policy.

I want to show to you one new approach that we've been exploring. This approach would be allocation to load. This would mean that instead of giving emissions allowances away for free to generators, you give emission allowances away for free to load serving entities, those retail entities that deliver retail electricity directly to customers. In the vast majority of the country, those load serving entities are regulated by public utility commissions or else through municipal regulated utilities.

The slide shows what would happen if there was free allocation to load generators based on emissions. The top graph is a replication of what was down below in just the previous slides. I'm showing it here so we have a point of reference. The bottom graph is free allocation to load.

We see the top slide shows a sort of asymmetric result that half the nation is going to experience an important increase in electricity prices and the other half of the nation is not, based just on the nature of regulation at the state level, but if there was allocation to load based on emissions, as shown in the bottom graph. You would see then a shift in electricity prices in competitive regions of the country to the left also. To the extent that free allocation is intended to provide compensation, that competition would be received in this case by consumers who bear eight times the cost of those borne by producers. This represents potentially a way forward. That there are important companies in both regulated and competitive regions of the country that are concerned primarily about their effect on consumers because it affects their long-run prospects for growth in their regions of the country. This kind of symmetry may be a useful attribute. But that doesn't mean that this solves all of our problems.

As I mentioned previously, economists have problem with any kind of free allocation because from a macroeconomic perspective, within a computable general equilibrium model, this will raise the cost of the program for the overall economy. This type of free allocation to load is a subsidy to consumers of electricity, and it would raise by about 15% the price of allowances within a nationwide cap-and-trade program. If you are a natural gas consumer, or you're an industry that's affected elsewhere in the economy or if you drive a car, then compared to electricity consumption, you would see a subsidy for electricity consumption that you would not enjoy as a consumer of energy CO<sub>2</sub> elsewhere in the economy.

Here is the new dilemma and perhaps an opportunity. A permanent allocation to load constitutes a windfall to consumers and that's a subsidy to electricity prices. The parochial assignment to value, I argue, to any one sector of the economy would lead to different marginal costs throughout the economy and this has the prospect of dramatically raising the cost from a nationwide perspective and that's why economists want to avoid this. It greatly increases the social costs of climate policy.

One solution is to have some sort of federal guidance on cost recovery to the electricity sector so as to reconcile differences between regions. Allocation of load maybe also contributes to the solution but it is useful only as a transition to an auction. The virtue of this approach is that using allocation to load provides a mechanism in the short run to avoid sudden changes in electricity prices for consumer. This is the normative advice that falls out of the economics.

Thank you.

MR. LITZ: I'm going to shift to talking about what's been going on in the states across the country and I'm going to quickly go through my slides, most of them, which have very little text and hopefully save most of my time for the end because there are a lot of interesting questions that arise out of the developments of climate policy on the state level and the regional level, interesting questions for how the federal policy might be developed, or how the state experiences might inform that federal policy. So initially I'll look to provide context on state emissions, state actions that have occurred and then focus on regional action. The one exception to being general, I'll focus in on RGGI, the Northeast Regional Greenhouse Gas Initiative, which is the only state level cap-and-trade program that has made design decisions to this point. So I'll let you know what some of the interesting design decisions there have been and it happens that those design decisions play right into federal considerations. They set precedents for the federal debate. And then I'll end with just some interesting questions on how these developments lead to ways of thinking about federal policy.

So let's take a look at this slide. When people think about is it appropriate for states to act or regions to act in the country on climate change, they lack this information. If you see the dark states have more emissions than the light states and if you were, if you were the dictator of the country and you could point your finger at the areas of the country that should reduce, you might make certain decisions about where you would get your reductions or where you might apply your policies based on these graphs.

Here is state per capita emissions. Before we had total emissions and of course that's related to population and economic growth. Here we have per capita emissions and so that's related to the efficiency of the economies and you have California which is one of the fastest growing economies and also one of the most efficient—carbon efficient—economies. New York, the big emitter but very efficient in terms of per capita emissions. Many of the states that have low emissions totally have bad per capita emissions so they tend to be less efficient. So that's just a little sense of where you might go if you're looking to get reductions in terms of carbon efficiency in those areas.

What have states done? States have been active on a number of fronts. Here you have those states that have mandated ethanol and bio-diesel in their economies. Here are states that have enacted renewal energy mandates. One of the first waves of clean energy action of course as you know. And then there is this movement across the country for states to have stakeholder initiatives where they bring together people from across their economies to develop climate change action plans on a comprehensive basis across the economy. In other words, knowing what we know about our states, where can we get reductions and knowing that we need to get reductions, where can we get them?

This is the map in 2006 and this is the map in 2007, so you can see that these state climate planning processes are really becoming the norm and interestingly we have more in the Southeast and more in the Midwest. And the result of these climate processes as I mentioned is the climate action plan has tended to be very comprehensive and have sought to get reductions not just from the electric sector, not just from industry but from transportation, from agriculture and they tend to be very state specific, looking for reductions where they can be found at the state level.

Here is a map showing the states that have greenhouse gas reduction targets and it covers about 30% of U.S. emissions. And so then some people have argued, well what does that get us? Maybe we should just let the states do this: they've been very active and the federal government hasn't been, so let's just leave it to the states. But if you take all of those state climate action plans and you look at what it means for emissions in the U.S. as a whole, this is all it gets you. So it does take a bite out of business as usual trajectory, but it doesn't get you even a stabilization of emissions at the national level. I'm going to come back to that graph in a minute after we take into account some other things that are going on on the regional level.

One of the interesting developments that began on the state level, went regional and is now more or less national is the Climate Registry. The Climate Registry started out in California with the climate change or the California Climate Action Registry and then went to the Northeast and took the form of the Eastern Climate Registry. Then there was interest in the Midwest by the LADCO states to develop their own registry. They started to talk to each other and they said all right, look. There's no point in reinventing the wheel here. We're all going to end up using the WRI Protocol as the basis for our voluntary registry so let's see who else we can bring to the table. They approached WRAP, the Western Regional Air Partnership and low and behold, you end up with a forty-state uniform climate change registry. Now I should note that there is a federal registry that the DOE administers but the states rejected that registry as not being good enough and so now you have, what they like to call a new national registry that pretty much covers the country. Other regional initiatives: RGGI, one very close to my heart that I've been very involved in as you've heard is an electric sector cap-and-trade program that covers the ten states you see here. It covers the electric sector; it only covers power plants at the emissions source. It's like the EU emissions trading scheme insofar as it is emissions-sourced based. That program will stabilize emissions through 2014. It launches in 2009, a year from January. It will seek a 10% reduction by 2018 which corresponds in these states to about 13% below 1990 levels by 2019 because these states have seen already a change away from carbon-intensive generation toward less carbon-intensive generation. People ask me what about RGGI has legacy value. You know, if you assume that there's going to be a federal program then, when you're thinking about regional programs or state programs, what you want to know is what is interesting about that program; what might be carried onto a federal program and one of the things I like to point to is the offsets component. Very little has been done on offsets. Some of what RGGI did we stole from EPA. EPA has done some work in their voluntary programs to come up with protocols, including, SF6. What we did in RGGI is we took a standards-based approach to offsets, came up with standards on each project type so that your project developer should know before he lays any money down what types of projects will yield him good credits.

I should probably stop and say what an offset is. You've heard about cap-and-trade from Brian and a little bit about allocations from Dallas. And one of the interesting things about carbon cap-and-trade is that you, you don't have an end of stack technology that can scrub your emissions. So what has come from that reality is a recognition that there may be a need to have another way to get reductions to meet the sources obligations and this is what an offset component

of a program does, is that it allows your sources to go outside of the sectors covered and to demonstrate reductions by implementing projects. And here in RGGI, they can do that by doing national gas or propane or heating oil efficiency projects, demonstrating a reduction which is then issued a credit by the regulatory authority. That credit can be used in lieu of allowances on the program.

In addition to the offsets component, the allowance distribution in RGGI has really been a significant precedent and is often pointed to, both in Europe and in the federal debate about how allocations might be done in a federal program. The states started out by agreeing that at least nearly 25% of the allowances ought to be auctioned or more generally put, as it is stated in the MOU toward a public benefit allocation. After they went off to begin implementation of the RGGI rule in the states, however, it became pretty clear that one after another of the states was opting for 100% auction and now you see here the states that have decided on 100% auction and those who have yet decided their allocation process. There has been another good lesson in the RGGI auction design, which Dallas was brought in to help with. The auction design recommendation is in and the states are mulling it over.

Some other RGGI features that I think are worth noting—there is a three year compliance period which is to say that sources don't have to cover their emissions with allowances except every three years. So unlike in the SO<sub>2</sub> program where it's done annually in RGGI, it would be done every three years. And this is recognition of the different nature of CO<sub>2</sub> in that it's a long-term concentrations that we're worried about and not short term. A few other things that are interesting about RGGI up there.

So RGGI started in 2003 and then last year in part after Governor Schwarzenegger had plotted a course toward cap-and-trade, the Western states came together to form what is known as the Western Climate Initiative and those are the orange states with observers shaded in cross-hatch. I apologize for the cough drop but it's preferable, believe me to my coughing at you. And then most recently and this in fact just a couple of weeks ago, the Midwest governors came together and said we're going to do a regional cap-and-trade program so the states that are shaded in green there have agreed to design a cap-and-trade program, economy wide, over the course of the next year. Important to know both the West coast and the Midwest are economy wide cap-and-trade programs, unlike RGGI, which is purely electricity. So what does this mean? I showed you the graph before with the thirty state plans and assuming they made all the reductions that they have in their plans and met their targets, you get to that blue line. If you bring in the Midwest states that are a part of the Greenhouse Gas Accord announced two weeks ago, you start to see a much more dramatic action. It doesn't get you all the way there; it doesn't get you back to 1990 levels but it starts to get you interestingly closer to where some of the federal programs get you. Query whether this should not impact the debate about which bill is a good bill in Washington or not. Because if what we have with the existing action at the state level is essentially Bingaman Spector, then why do Bingaman Spector? There may be reasons, of course. You know you have states that may be covered that aren't covered by the existing state action, so for equity reasons you might go with Bingaman Spector but in terms of getting the reductions, if that's your main goal, you may need to look to one of the other proposals. And this

incidentally is something you'll find on our website. We update it periodically. It was done by one of our analysts at WRI and has become quite a thing here in D.C. The Congressional staffs are always looking for the latest graph showing the latest proposals and they're eager to meet with us to find out how we're going to chart their proposal. It sort of took on legs that weren't intended when we first posted it. Lieberman-Warner, which I think most people think is the bill to watch has this kind of trajectory.

Okay so now on key issues and I probably have one minute to just flag these. It's worth taking a minute to think about what states are doing differently from some of the approaches debated here in D.C. and one of them is that states are generally taking a much more comprehensive approach to climate change. So they're looking at all sectors. It's not just cap-and-trade; it's not just cap-and-trade plus RPS; not cap-and-trade plus RPS but some energy efficiency; they're looking at agriculture, local land use planning, and the like. They are some legacy issues as I mentioned that may be taken from the cap-and-trade designs that emerge out of the states and then here is this issue of now that the federal government has gotten around to talking seriously about proposals and it seems likely that they're going to adopt some form of climate change legislation, maybe not pre 2009 but shortly thereafter, then what should happen to these state efforts? Should they all be pre-empted? If they're not pre-empted, how do they get rolled up into a federal program? And given that the states have been far more comprehensive about their climate change planning, how do you divide the roles between the federal government and the state government? Surely the states will always be land use regulators for example. Well how can the federal government incorporate that into a federal program? And I'll leave you with one thought since this is a cap-and-trade seminar. One very important thing to remember when you think about these issues and you've seen here that states have been out in front. They've been pushing the policy envelope and as we think about adopting a federal program, it's worth at least considering preserving some ability for states to continue to drive policy after a federal program has been adopted. But with a cap-and-trade, if you have a federal cap-and-trade, and cap-and-trade is one of those examples of something that's definitely better off to do on a national level. The bigger the cap-and-trade program, the better. The more sources it covers, the more low cost opportunities you'll cover or you'll unearth. So let's say you have a national cap-and-trade and then you have one state like California or New York who wants to go further than a national cap-and-trade. If I'm New York and there is a federal cap-and-trade program in place, any additional action that I take to reduce emissions in New York from sources covered by the federal program, simply frees up federal allowances that can be sold elsewhere in the country. So bear in mind that it's a numbers game and you can be more aggressive in the states but you don't necessarily see a reduction over all in the country. So in order to address that point, there are a number of things you could do. The federal government could give control of the allowance budgets to the states, similar to what they've done at least partially in the CAIR program that Brian mentioned. You could allow states to retire allowances to buy up allowances or capture allowances somehow and retire them in order to tighten the overall cap. But those are just two examples but if we want states in this federalism construct that we have to be able to drive climate



policy within the context of a federal cap-and-trade, we need to be creative about how that's done. So that's all I have.

MR. KING: Okay. My presentation is going to be a little bit different. It's eight slides and I just want to walk you through a couple of things. First of all, I'm a carbon trader and there aren't many of us in the U.S. yet. Most of my competition is in London. London is about five years ahead of the U.S. right now for carbon trading. It's a lot better understood over there and most of the market is over there. The whole reason behind that is that we didn't ratify the Kyoto protocol. So most of the market that I deal is the ETS, the European Trading Scheme. The reasons why it's the most liquid, there are many more participants, the deals are bigger and it is the most regulated market. I'm going to go through a slide that explains that a little more but you know what you're buying there because of the regulations. Here in the U.S. it takes a lot more due diligence, a lot more work to understand what you are buying. While that's fine and there are some quality projects here, someone like me who trades, doesn't want to always have to do a bunch of due diligence and research on the project. We want to buy something, know what it is and just start trading and that's much more prevalent in Europe right now.

Credit Suisse has been in this market for about two years. We're really the only Wall Street Bank who's carbon group is based in the U.S. The reason why that is, is because a lot of the market that we deal in, the offset market, is an emerging market and most of our emerging markets is done out of the New York. Roughly 70% of my time is spent traveling to Asia, Latin America, or Eastern Europe to find projects that we can buy credits because a lot of this trading right now is done over the counter and doesn't clear on exchanges. A typical trade that I'll do is go down to Mexico or Brazil and talk to a landfill gas project developer and while the gas production is about 80% of the revenue, there is still a lot of value in the carbon contract. And so I need to go down there and try to help him monetize the carbon, hopefully with Credit Suisse but it's done through an ERPA contract, Emissions Reductions Purchase Agreement; it's a thirty or so page document that explains what the contract is and it's directly between Credit Suisse and that counterparty. Another problem is that there really aren't that many lawyers in the U.S. right now that do this so that everyone I talk to is in a different time zone and I'm getting up at two in the morning to deal with London or India and it would be very helpful to have some lawyers in the U.S. that understand carbon. Also, my prediction is that there are going to be more people in the next two years like Credit Suisse that are doing this stuff.

Moving on we ultimately are just a middle man because we're not an end user of the carbon. The end users are the compliance buyers, the people that have caps on their emissions; the people who need to meet obligations at the end of the year and they don't all send people to Brazil and the Ukraine and Malaysia to find projects. But they still need to meet this obligation. So Credit Suisse will go in or you send me to go in, paper that transaction, and then I'll send that contract to our traders and our marketers who will go to Europe and try to market that contract out to other parties. This is an over-simplification, but a lot of the way we do this is using our balance sheet because even if I do a deal with a new technology, in Malaysia, such as a palm oil deal, that project may never work. But Credit Suisse can fully back the carbon from this project and when we sell it to a utility in Europe, they don't need to understand the project and if it doesn't

produce, they will still receive carbon from us. This is what this market needs because it is all project based. It's very hard to understand what is going to happen next year when the project is up and running.

And the other thing this market really needs is options. I work on the commodities trading desk and sit next to power traders and gas traders and they're all writing calls and puts and swaps and we're just starting to do that now in this market. Because of all the volatility of carbon is so high, you can imagine what a call's worth for a near the money 2010 carbon contract. It's very high to stomach risk if you are going to write that contract. This is just a simple slide that explains the market that I'm dealing in. The Kyoto protocol breaks the world in half between developed and developing countries. Developed countries have to buy credits; developing countries can sell credits. And joint implementation is for the "transition" countries, like Europe and Russia, Ukraine, that are allowed to do projects as well. Two years ago, everyone thought that the JI market was going to be much further along because the countries are more developed and were going to lead the charge. It didn't happen. Instead the developing countries with the CERs, certified emissions reductions, are probably about 90% of the market right now. The main reason for this is that China quickly understood that participating in this market was going to generate a lot of investment in their country. So about 42% of all credits and project based mechanisms right now are out of China. This won't be true in a couple of years because they pulled a lot of the low-hanging fruit fast, faster than other people. And India is growing quickly. I spend a lot of time in India trying to get projects up and running. I sort of spoke about this point when I first got up here but this slide is why Credit Suisse, only deals in Europe. It is because this is what it takes to get credit in Europe. The point is not to understand all the different stages of validation, registration, monitoring.

The point is to understand that third parties are going in there, every step of the process is very highly regulated. For someone like me who just wants to buy credits, if someone can tell me right at the end, well we have been issued credits and they're CERs. As soon as I know it's a CER, I know what the price is going to be or what I want to pay for it and in the U.S., if someone says we have a VER, verified emissions reduction, it's going to take you two weeks to figure out what's behind that. So that's why VERs are worth about \$5.00 and CERs are worth about eighteen Euros. Because someone like me needs some certainty that the credit is from a valid project, knows what's behind it, and not have to discount it, a Euro or two for every day that I need to spend on it. There've been mistakes in the market as a lot of people know. Phase I of the European Trading Scheme was considered the warm up period. We knew there were going to be problems and there were problems. We need to get over it now. All I read in the paper is that the market will never work. That's history. Like there were mistakes. It was over allocation. Phase II right now is working properly and you can see it is trading in a much tighter and higher band. The blue is 2008 and beyond and it is actually functioning properly. Some of the basic terms that we deal in are these ones here on the slide. All this slide is meant to show is kind of what everyone knows intuitively. The dotted line is where we would be without a project. That line is easy enough to draw on a graph but it is much more difficult to calculate in a real project. The methodologies in Europe are highly regulated. They've been approved and run over by third parties and additionality,

all that means is sort of the area below that dotted line, is what the true offset production has been with the project. Because you're not going to get credits for something that would have happened outside of carbon market. That's all that additionality is meant to show. Okay I have two more slides, so I'll finish up. These are the lessons learned that we have from the first phase, from a couple of years ago and the reasons why. One, we need to have a longer term framework. Even now, the five years from 2008 to 2012, Phase II, it is very short. If I am going to invest in a project and spend \$30 million to get some pipelines fixed in Russia or a landfill gas project built in Latin America, that's only a five year return that I'm going to get. If it was ten years, it would be much easier to spend the money down there because you can get your return much easier. So five years may seem a lot, but it's not when you are spending real money.

Second, the linkages to other GHG systems, the greenhouse gas markets, my biggest fear in the U.S. is that we're going to have a U.S. credit and its not going to be tradable in Europe, it's not going to be tradable anywhere and we're going to go about it our own way. It really needs to be like oil. It needs to be fully liquid and usable all around the world and that's why oil trading works and its how greenhouse gas trading will work. And since in an effort of time, my next slide is sort of a fun slide. Just before I show it to you guys, my quantitative guy did it to try to show to some of our U.S. buyers and it's all right I'll show it to you but I'll explain it to you. He was horrified when I said I was going to come up here in a presentation and show it because he's a stats guy and I told him if you are going to go to a sales person and show him a pretty slide, he's probably going to use it with clients. The red line is the spot market for carbon. And the two blue lines are power prices, so this is, what I'm trying to do here is link European carbon pricing with U.S. power prices. So before you guys criticize me, it looks like from this slide, you could potentially draw the conclusion that the darker blue line, which is Cal 13 and Cal 16, it's a longer dated power contracts are somewhat linked to the carbon pricing. So you could jump to the next conclusion and say that people who are trading power longer dated are actually looking to Europe because they think that the U.S. is going to participate in the carbon market and are starting to price in power contracts. And its not happening so much in the current trading scheme, Cal 8 to Cal 12 because you could draw the conclusion that people think in the U.S., its not going to happen that quickly. So this is true data, what you are seeing in the market. That's all I have.

MODERATOR: Well our schedule is kind of blown but do we have time for some questions? One or two, all right. Okay in the back on the left. Margaret, you. I'm sorry. We've already violated one of the earlier rules. Remember we need to speak into the mike because it is being transcribed. They're up here.

Q: One of the slides shown or one of the speakers stated that consumers pay eight times the price or cost of what say I owned a coal plant, I would pay to comply and then yet we saw some other slides that showed potential differences in payment between regulated and unregulated areas, depending on how emission credits were allocated and I'm wondering if the two of you could explain to me how your two statements might mesh. In other words, would consumers pay eight times no I'm just trying to understand the two slides, you know the two statements together.

A (Burtraw): That was me before the break and after the break. Those were the two speakers. No, the point was that from an industry-wide perspective, the costs that are borne by the industry are one-eighth of the cost borne by consumers in terms of change in payments for electricity services for delivering electricity in an electricity sector. Within the electricity industry, there are winners and there are losers. So it's not like the cost borne at an individual coal plant is being considered there, but rather the cost borne at all generation equipment throughout the economy. And within an equilibrium context, that is where will, what will be the new level of electricity prices on a regional and time of day basis throughout the country and you aggregate across that. There's no free lunch. Carbon policy cost something and our modeling suggests that so does the energy and information administration's modeling suggest roughly that consumers are going to bear eight times the cost of that borne by industry on the whole. But within the industry there's going to be winners and losers.

Q: When you say eight times, is that because most of the cost will pass through? Is that the reason?

A (Burtraw): Yes.

Q: So a relatively small portion is not passed through, but the rest is?

A (Burtraw): Yes.

Q: That's why the consumers get it?

A (Burtraw): That's correct.

Q: Also, is there a way that a regulated state can adjust its way it does pricing on regulation to address the problem that you pointed out? In other words, could regulated states change the way they set the regulated price and therefore overcome this differential that you pointed out between a competitive state? Is it simply a matter of how you do the regulation or are you saying that it is inherent in regulation and cannot be adjusted?

A (Burtraw): I think it is inherent in regulation and cannot be adjusted because what happens is in regulated states, the price, the change in price turns out to be less and from the perspective of state utility commissioners, their reason for being is to keep electricity prices as low as possible. Often that's part of their, what the requirements under state constitution is to promote economic development within their state. So their mission is not primarily to address climate policy. Their mission is to deliver electricity services at the lowest rates possible. So I think there's no political economy reason why from a state PC perspective, they would agree to a pricing mechanism that led to an increase in pricing if they didn't have to do so. So if they get the allowances for free, the Uniform System of Accounts requires them to pass them through at original costs and that original costs would be zero. But in competitive regions of the country, you would see competitive generators pricing at opportunity costs.

MODERATOR: All right. We have time for one more question and I'm going to exercise a moderator's privilege and ask it myself. So Brian, I have a question concerning this proliferation of potential cap-in-trade programs on the states versus the national/federal scheme. California has been dabbling with the idea of having actually what we call the load-based cap-and-trade scheme where emissions and allowances go to the load rather than the responsibility of the emission sources. It seems very complicated to me. Based upon your

experience with Acid Rain and so forth, what problems do you see what that being done state by state?

A (McLean): That's good since I don't have to deal with this yet. You know, I think the advantages of what the states are doing is that they are experimenting for lack of a better term and looking at different ways of approaching this problem. There's been a lot of I would say good education over the last several years in the RGGI work and the work that Dallas has done for RGGI but also all of us talked to California. And each state as they grapple with this, sort of reviewing the options and honing the options, what will come out of this, I'm not sure. And then you match that with the federal effort. My concern is mostly that if the states don't agree to the same approach which has rarely happened in the past, they all come together over one approach, and they end up developing systems that go into operation very differently, it becomes more and more painful to make the adjustment to a common approach which I think was pointed out by our trader. The larger the market, the more common the approach everyone benefits from it. So we run the risk of creating either a problem or a painful situation to adjust to and that's what I'm mostly concerned about. That we don't get together. Now in the past, I mean in the 80s, New York, Minnesota, Wisconsin, and maybe a couple other states, proceeded with Acid Rain legislation and setting up programs prior to the federal program. When the federal program came into play in 1990, those state programs basically disappeared because the federal program accomplished the same objective that the states set out to do. And you know and wiser minds said what's the point of having multiple programs that aren't doing, adding any value. I assume that a similar thing could happen but it hasn't happened yet and I do worry about will the federal program be as rigorous as the state programs. Will it be viewed as being comparable and satisfying the desires there? So I think we have a larger political issue here to resolve and the sooner we do it, the less pain there will be for everyone and the more advantages it will be to the result. So that's I mean that's the way I'm looking at it right now.

MODERATOR: Franz, you have the last word.

MR. LITZ: I agree with Brian. I just wanted to note that there was this case where New York proceeded and other states proceeded with Acid Rain legislation before the federal program. It's also important to add to that that perceiving the inadequacy of the federal cap, still having this Acid Rain problem in the great, in the Adirondack Lakes, New York continued to push the envelope even after the SO<sub>2</sub> cap-and-trade program came in, implemented its own statewide cap-and-trade program that happens to have similar cap levels as the new CARE. And it will be merged into the new CARE. The reason I bring this up is what you had there is a dynamic where the states pushed the envelope initially, the federal government followed, the states then pushed the envelope again and the federal government followed with a similarly rigorous CARE program. As we think about federal legislation, it's important to keep those case studies in mind. How do you preserve that way, that sort of federalism back and forth, the push and pull between state and federal government?