

NATIONAL COMMISSION ON ENERGY POLICY
Design Issues in Market-based Greenhouse
Gas Reduction Strategies

L'Enfant Plaza Hotel
480 L'Enfant Plaza, SW
Washington, DC 20024

Workshop 3: September 30, 2005
Allowance Allocations

FINAL AGENDA

Welcome—Jason Grumet, National Commission on Energy Policy (NCEP)

Introductions—Robert LaCount, Cambridge Energy Research Associates, Inc. (CERA)

Allocation Choices for a US Carbon Dioxide Emissions Trading Scheme—David Harrison, NERA Economic Consulting

Who Pays for GHG Mitigation?—Richard Morgenstern, Resources for the Future

Moderated discussion, led by CERA

Policy Options for Allocating Allowances Within an Industry Sector—Daniel L. Chartier, Environmental Markets Association and Environmental and Market Strategies LLC

Moderated discussion, led by CERA

ADMINISTRATIVE ITEMS

All workshop presentations are posted on the NCEP Web site (<http://www.energycommission.org>). Participants are invited to send comments and additional materials for posting on the Web site to Info1@energycommission.org.

The final workshop in this series focuses on incentives for promoting energy technology innovation and deployment within a greenhouse gas (GHG) market and is scheduled for November 9, 2005.

MODERATED DISCUSSION

Robert LaCount, CERA, facilitated open discussions following Richard Morgenstern's and Dan Chartier's presentations. The following summary categorizes the main comments made during the discussion into several major topic areas.

Distributional Effects of a Greenhouse Gas Market

- Analyses performed by Resources for the Future (RFF) have identified the amount of carbon dioxide (CO₂) allowances that could be allocated to the electricity sector to compensate that sector for economic losses incurred under a climate change policy. If the industry were one firm, 10 percent of all CO₂ allowance allocations would be sufficient to compensate the industry for the costs associated with a climate policy. However, each firm has a different portfolio of assets. Many companies turn out to be winners, including operators of nuclear plants, and many companies are losers. To compensate all of the companies that are economically harmed would require 21 percent of the total CO₂ allowance allocations. So one must ask the question, How can the losers be compensated without overcompensating the winners?
- One firm's windfall profit is another firm's incentive. It is important to allow CO₂ price signals to go through to a point where we increase the efficiency of electricity production and our ability to achieve carbon reductions at a lower cost to the economy. We get ourselves to the wrong place when we focus our attention on how to keep certain sectors or firms whole under a climate policy. We need to look at the overall macro-impacts of a policy, and we need to figure out how to reduce the overall costs of the program.
- We have heard today that a number of analyses show that regulating GHG emissions can create profits for certain firms. Many policymakers will question the theory that it is possible to impose a mandatory GHG regulation program that will create windfall profits. This is a very complicated issue to discuss with policymakers and stakeholders.
 - The oil industry provides an example of how windfall profits can occur. Oil companies are currently making large profits as the price of oil hovers around \$60 per barrel. Many of the companies' investments were made when oil sold for \$20 per barrel. Companies are reaping the benefits of past investments. In a GHG market, if you lower the allowable emissions, whoever operates low-emitting sources and holds the CO₂ allowances will make a lot of money as the price for the allowances rises.
 - When evaluating the effect that a GHG market will have on profits, one should consider that allowance allocations are likely to be phased out. If and when allocations are phased out will change the results of the economic modeling. The number of allowances required to compensate companies for future economic losses would need to increase substantially in the near term if the policy were to phase out free allocations over time.

- The economic impacts of a GHG market go beyond the parties that own capital. Even if you compensate the owners of capital, there will still be a net cost to the economy because consumers will also be affected. It is not possible to compensate everyone in the economy through allocations. This is why it is very important to design a program that achieves the policy goals as efficiently as possible.
- Today's discussion regarding distributional effects represents a big improvement in the allowance allocation debate. Restricting carbon emissions creates a value for CO₂ allowances. This value is bigger than the actual resource costs of all of the measures taken to meet a carbon limit. This discussion and Senator Jeff Bingaman's draft legislation put forward an important principle for allocations: that allocations should not overcompensate. Once this principle can be agreed to, it becomes fruitful to discuss how allocations should be made at the firm level. This is an important issue for environmental groups because customers will eventually have to pay for the carbon program, and this has implications for the long-term viability of the policy. We should agree to a principle that industry should not be overcompensated through allowance allocations. Additionally, some of the value from allowances should be used to cushion the downstream impacts to consumers and to provide incentives for investments in low-carbon technologies.
- There will be winners and losers under a GHG market. Most electricity generation companies don't mirror the generation portfolio of the entire country. For this reason, it is important not to generalize the cost impacts of a future CO₂ policy based on costs that are measured for the overall sector.
- There is also the issue of the tax treatment of free allocations. Currently in the United States sulfur dioxide (SO₂) and nitrogen oxide (NO_x) allowances that are allocated for free are not subject to federal taxes. In the European Union free CO₂ allocations are taxable at the market rate. This is a very real difference for companies operating under these two systems.

Relationship Between GHG and Electricity Markets

- A substantial part of the US electricity industry does not operate in competitive markets. These companies operate under cost-of-service models. How are these types of companies modeled in studies that evaluate the economic impacts of climate change policies?
 - The assumptions vary under the different studies. Economywide analyses that evaluate the overall impacts to various sectors do not account for different regulatory models and assume market-based pricing. In electricity market studies performed by RFF, the modeling accounts for the areas of the United States operating in cost-of-service markets versus competitive markets. Under the cost-of-service markets, RFF assumes that electricity regulators allow costs to be passed through according to average-cost calculations.

- The issues of windfall profits and their effects on electricity prices are very different. You can deal with the effects of windfall profits by auctioning allowances. However, electricity prices will rise under any allocation scheme. If you are going to implement a program that efficiently reduces the overall cost of meeting a given CO₂ target, you need to have the CO₂ price effect to provide an incentive to reduce emissions. You can't deal with electricity price increases and windfall profits under a climate policy without having some adverse effects on electricity markets and the cost-effectiveness of the CO₂ program.
- Many of the states that have a significant amount of coal-fired generation operate with cost-of-service electricity markets. In these states, the full opportunity costs associated with CO₂ allowances would not be passed on to the consumers.
- The public power sector will not make windfall profits under a free allocation system. If allowances are allocated for free, the public power sector will not be able to pass the full opportunity cost of CO₂ allowances on to consumers. If the objective is to raise costs to consumers, the CO₂ allowances should be auctioned. If the objective is to mitigate the costs to consumers, then allowances should be allocated for free.
- We have heard from electricity companies subject to cost-of-service ratemaking that the decision to allocate or auction CO₂ allowances will make a real difference in electricity prices. The academic position seems to be that it will make no difference to electricity prices. What opinions do people have on this topic?
 - This is a complex subject and the economic impacts of the program are subject to a variety of variables. In addition to the impacts of free allocations and auctions under different electricity market regulatory regimes, other issues will affect electricity prices. These other factors, including whether there are new entrant set-asides and what fuels are on the margin, are more important for influencing electricity prices than the issue of auctions versus free allocations.
 - When you give allowances to a regulated utility, it is as if you give allowances to the public utility commission (PUC). The actions of the PUC will matter, but it is difficult to predict how each PUC will respond.
 - The economic impacts of a GHG market will be influenced by how the electricity market is regulated. There are even incentives in some competitive markets for not passing all costs through to consumers. The State of New Jersey uses a reverse auction for determining which companies are awarded the right to supply electricity within the state. Most companies that generate electricity would like to obtain contracts for 70 to 85 percent of their electricity capacity. This provides an incentive for companies to bid their supply at a lower price than usual in order to have a greater probability of winning the contracts. This means that many companies are supplying electricity into the market for a price that is less than their marginal cost.
 - PUCs do not directly regulate public power companies and cooperatives. These companies are regulated by locally elected officials, and this adds another variable in determining how a GHG market and its associated allocation options will affect electricity prices.

- GHG markets introduce an additional cost to generating electricity: the opportunity cost for the CO₂ allowances. Changes in electricity prices resulting from a GHG market are influenced by the fuels that are on the margin and the current price of CO₂ allowances. In Europe the current allocation discussion would not be so intense if the price for allowances were €7 rather than €25. The regulation of electricity markets is also a major issue affecting how costs are passed through. Other climate policies may also affect a CO₂ allowance market. For example, a renewable portfolio standard would affect CO₂ prices, which would then affect the electricity price increases. This is a very complex set of markets. We do a disservice when we simplify the discussion about windfall profits—it is difficult to determine how all the different variables will sort out in the markets.

European Union's Emissions Trading Scheme

- Options for changing allowance allocations do not address the issue of economic costs to end users. For this reason the debate in Europe has turned from how to allocate allowances to how to regulate the electricity system.
- In Germany officials seem to be rethinking their allocation program due to concerns about whether there is cartel behavior occurring under the current system. The theory is that a large number of allowances were allocated to a small number of companies and that these companies may not be interested in selling allowances to competitors. Has this issue been studied?
 - In addition to how allowance allocations are determined, the amount of CO₂ costs that are passed through to consumers may also depend on the relative competition that exists within the electricity market. A variety of factors will influence how costs are shared among different companies and consumers. These issues are currently being studied in Europe.
- The European Union is currently considering its second round of National Allocation Plans. We have heard comments today regarding how many years should be covered under the initial allocation. One theory states that a longer allocation period provides greater certainty to the market. The European Commission sees an advantage in its system that allocates allowances for limited periods of time. The next round of allocations will cover from 2008 through 2012. The European Commission feels that it can learn and make adjustments to the program as it moves forward.
- In response to current CO₂ allowance prices in the EU Emissions Trading Scheme (ETS), is the European Union considering a cost-control mechanism going forward? Canada recently adopted a C\$15 cost-control mechanism. This is a way to minimize some of the complexities and uncertainties associated with the cost impacts of a GHG market.
 - The EU ETS does not include an explicit cost-control mechanism. However, credits available from the Kyoto Protocol's Clean Development Mechanism and Joint Implementation programs are considered mechanisms for lowering CO₂ allowance prices in the EU ETS.

Political Considerations

- If you look at the analyses showing the windfall profits associated with GHG regulation, you would expect to see many firms clamoring for a mandatory program—but that’s not what we see in reality. We should assess what is actually motivating behavior in the corporate sectors. Why is there a lack of enthusiasm for proposals that could bring large windfall profits to industry?
 - Many of the analyses are based on a set of modeled outcomes. There is uncertainty because firms do not know if they will be able to pass costs through to customers as assumed in the modeling. Also, the allowance allocation system is not static. Although allowances may be allocated for free in the beginning, the program could change to an auction, thus eliminating the windfall profits associated with allocations.
 - There is enormous uncertainty in the modeling—especially regarding cost pass-through. Analyses for the EU ETS show that a €15 allowance price could affect electricity prices anywhere from 10 to 60 percent depending on the assumptions made. In the European context people are worried that the game could change in terms of the allocation.
 - When you have concentrated impacts on a small number of sectors, a number of questions arise. Political considerations suggest that 90 percent of allocations should be handed out for free, but economists argue that it should be the opposite. There is clearly a middle ground that is likely to motivate stakeholders to move forward.
 - The debate regarding free allocations versus auctions is really based on the issue of windfall profits. The notion of windfall profits is premised on the assumption that CO₂ costs get passed through to consumers. Companies do not believe that the economic analyses accurately project how the costs will be distributed given the less-than-ideal realities of different industries. There is a lot of uncertainty in these analyses. The full opportunity costs associated with CO₂ allowances may not get passed through in regulated cost-of-service industries. There are other market issues that may also prevent the full costs from being passed through. This is why many companies are reluctant to support a mandatory program, especially when some of the models indicate that only a small part of the allowance allocations will be necessary to compensate companies for their CO₂ costs.
- During the development of the EU ETS, many studies found that it would be most efficient to auction the CO₂ allocations. However, the European Union decided to allocate the majority of CO₂ allowances for free. It has been stated that the US Congress addressed many political considerations when deciding the final SO₂ allocations. Is anyone aware of studies that evaluate the degree to which economic considerations will affect allocation decisions, or will the final allocations be mostly based on political considerations? If it is ultimately based on political considerations, it is difficult for companies to assess the implications of a future program.

- The European Union is currently evaluating how the process for determining the 2005 through 2007 allocations has gone in the EU ETS. Decisions regarding allowance allocations tend to be no one's first choice, but no one's last choice.
 - There is a collision between economic science and political science when determining allocations. The average consumer is likely to get a lesser share of the allocation. A logical place to start the discussion for granting allowances is to identify points in the economy where costs for CO₂ are not passed through to consumers.
 - When the United States considered imposing an energy tax, many industries and firms lobbied against the bill even though many of these groups would not be adversely affected by the tax. Based on this example, it is important to increase the amount of information and analysis that is available on the expected cost impacts resulting from a GHG market. There are legitimate claims regarding cost impacts. However, we need to sort out the legitimate claims versus the less substantiated ones so that we can advance the whole discussion of allocations.
- Ex-post studies of the SO₂ allowance program concluded that it is impossible to identify the political factors that led to the SO₂ allowance allocation decisions. This shows why it is difficult for firms to determine ex-ante how they will fare under a future CO₂ allowance allocation scheme.
 - There are two separate economic risks for companies operating in a GHG market that should not be confused. The first risk is associated with future allowance prices. Allowance prices may rise to levels that result in greater economic impacts than initially expected. As we have heard today, the inclusion of an allowance price safety valve can minimize the risk of allowance prices. The second form of risk is that a portion of a company's allowance allocation may be expropriated by future government actions. For example, the CO₂ cap may be reduced in the future. There are probably policies that could reduce this risk if we wanted to address it. These two risks require different policy responses.

Safety Valve

- We have heard about the high allowance prices in the EU ETS and how this event has triggered a debate about the economic implications of the program and how the program could be amended in the future. If a safety valve were in place at a price that is well below €29, we would not have seen the run-up in prices. The safety valve would have prevented the high prices.
- Among the choices for allocation systems, are there options that would perform better or worse when a safety valve is also included in the program?
 - In comparing the different allocation systems that could be applied to the electricity sector, the updating allocation system would generate the highest allowances prices. Allocation systems based on a historical baseline would generate the next highest allowance prices, and auctions would generate the lowest prices. Under these different systems, the safety valve would be triggered first under the updating system.

- As we discuss the use of a safety valve, it is premature to conclude that a future system would set the safety valve at \$7 per ton. If a safety valve is used, the appropriate price will be set based on a variety of factors, including the issues that we discussed regarding its interaction with the allocation system.

Temporal Considerations

- There is uncertainty about future government actions regarding climate policy, and that can undermine confidence throughout the economy. This gives us an incentive to provide as much certainty as possible in a GHG market by providing a long-term perspective to the policy. Building a long-term policy path into the initial climate policy will not eliminate all uncertainty, but it will help to reduce the risk of major policy changes and corresponding CO₂ price changes.

Potential Incentives for Investments

- Allowance allocations address more than simply who gets the one-time revenue associated with the value of CO₂ allowances. In the real world different entities bring different attributes to the table. The formula for allowance allocations can provide incentives for investments in low-carbon technologies that may be more likely to occur within one industry versus another. For example, allowance allocations that provide an incentive for power companies to invest in carbon sequestration could advance the introduction of this technology and could eventually lower the overall costs of the climate policy.
- The discussion of allocations could be tilted either toward the compensation of current players in the marketplace or toward providing incentives for investments in low-carbon technologies.
- The important question for allocations is how industry will behave once the program is in place. In the electricity industry, we need to meet growing demand and we will need to retire old assets. The power industry will decide what types of generation to build in the future, and this policy can provide incentives for investing in low-carbon technologies. Our analysis indicates that nonemitting sources of electricity generation have a large affect on the overall cost of a CO₂ program. A 3 percent increase in the supply of electricity from nonemitting sources reduces the cost of a CO₂ program by 50 percent.
- The appropriate incentives for energy efficiency improvements can vary depending on the point of regulation in the mandatory GHG market. If the program is applied upstream at the energy producer level, the CO₂ price signal would presumably pass from energy producers through electricity generators and on to the electricity consumers. Under this approach, consumers would have an incentive to reduce electricity consumption because of the increased cost of electricity resulting from the additional CO₂ costs. It would not be necessary to encourage energy efficiency with allowance allocations. Instead, allowance allocations could address the distributional issue of who bears the costs of the program.

- A number of available low-carbon technologies and strategies may not be employed without additional incentives. Examples include integrated gasification combined-cycle, renewables, nuclear, and energy conservation. There are a number of investments that would lower the overall costs of reducing CO₂ emissions. One way to provide incentives for these technologies is through the allocation of allowances.
- When considering allocations, it may not be appropriate for the policy to compensate the owners of old, high-emitting plants. Rather, the policy should promote actions that will lower future emissions such as investments in renewables and energy-efficient technologies. Output allocations and allowance set-asides provide the tools for promoting these technologies.
- If you have a cap of carbon and you use allowances to subsidize technologies that reduce emissions but are not otherwise competitive, then you increase—not reduce—the overall cost of compliance. One of the risks of a cap-and-trade program is that it creates an opportunity for rent-seeking behavior whereby various interests seek subsidies through allowances, which are not as transparent as money. We should keep allocation subsidies out of any future program in order to reduce the overall cost of the program.
- A variety of goals, including those to address distributional equities and social concerns, can reduce the macroeconomic efficiency of a program in the near term. This does not mean that they are not useful goals. The question is how these different interests will be balanced.

Options for Allocations

- Auctions are not favored by many in industry. The cost of allowances would go up significantly under this type of allowance distribution. For this reason, auctions are not a recommended solution.
- It is helpful to study Senator Tom Carper's Clean Air Planning Act. This is a legislative proposal for reducing SO₂, NO_x, mercury, and CO₂ emissions from the power sector. Allowances for each of the four pollutants would be allocated differently. SO₂ allowances would be allocated using a method that is very close to the current approach. Mercury allowance allocations would be output-based, but fuel-specific for coal. For NO_x allocations would be granted to all fossil fuels based on an updating output-based methodology. For CO₂, Senator Tom Carper's bill uses an updating output-based methodology for all forms of generation except for a limitation that only recognizes new investments in nuclear capacity. It is an interesting proposal that attempts to accommodate a variety of interests. It may be a useful tool for thinking about how to address CO₂ allocations under an economywide program.
- Economists have criticized the updating allocation approach because it can provide an incentive for expanding the production of electricity. It acts as an output subsidy that causes firms to perceive a different variable cost and expand production. This leads to a lower price for electricity and an increase in electricity demand. Others have questioned whether this subsidy effect would actually occur in a real market, especially when factoring in the different discount rates that companies use for investments and the uncertainties associated with predicting future allocations. Others view updating

allocations as a remedy to potential leakage problems. From this perspective, companies have an incentive to continue to participate in the GHG market in order to continue receiving valuable CO₂ allowance allocations in the future. These are the different trade-offs that one must consider when evaluating updating allocation systems.

- If an updating allocation scheme were to cause electricity prices to fall compared with what they would be under a static allocation scheme, this effect would limit the windfall profits that go to companies that pass on CO₂ costs while receiving free allocations.
- Economists are concerned about allocation schemes that limit electricity price changes associated with CO₂ costs. Economists want to see that the full CO₂ price signal is sent to consumers so that they consider this cost when deciding whether or not to buy an energy-efficient product. Policy choices that reduce this price signal in any commodity can lead to an outcome that is less economically efficient for the economy.
- Many of the allocation programs that states are using in the NO_x market use different forms of updating systems. We now have real experience with how these updating programs can work. Based on this experience, it is important to keep the theoretical analyses in perspective. For example, studies have attempted to identify whether the output allocation subsidy effect actually exists where updating systems are employed. To date, these studies have not been able to definitively show that this effect has occurred.
- In today's discussion, we have not addressed the Chicago Climate Exchange, which is a voluntary GHG market operating in the United States. Is this a model that we should evaluate for allowance allocation options?
 - The examples that we have discussed today apply a mandatory cap to emissions resulting from one or more sectors of the economy. If there were to be a US GHG market, it would presumably be a cap-and-trade program. There are a variety of credit-based trading programs that we have not addressed today.
 - The Chicago Climate Exchange represents another program that may provide helpful insights to the development of a GHG market. It would be good to understand why companies have joined the program and what they have learned while operating in it.

Manufacturing Sector

- For manufacturing sectors, the pass-through of CO₂ costs is limited by the prospect of imports. For cement manufacturers, if prices rise to a certain level, then the market for cement will be overwhelmed by imports from places such as China that may have much higher emissions per unit of product.

- The issue of international competition is a major one for manufacturing sectors subject to the EU ETS or located in countries implementing the Kyoto Protocol. This would be the same issue in the United States if this country were to move forward with a mandatory GHG market. This will remain an issue as long as all countries do not participate in a mandatory CO₂ program.
- Companies that manufacture steel in Europe and in the United States do not have the ability to pass on increased costs associated with a CO₂ program due to foreign competition. This is why the European steel industry is investing in other countries right now. The extra costs of electricity and CO₂ allowances resulting from the EU ETS have made the steelmaking business in Europe very difficult.

Relationship Between GHG and Voluntary Renewable Markets

- A number of power companies offer green electricity products to consumers on a voluntary basis. If a cap-and-trade program for CO₂ is created without reference to this voluntary market, the CO₂ market will offset any environmental improvement associated with green volunteerism by allowing emissions to increase elsewhere within the market. Is there a way to incorporate continued opportunities for green volunteerism under a CO₂ cap-and-trade program?
 - Once a cap exists, increasing the amount of renewables will not reduce emissions below the cap because of the emissions trading that occurs within the system. The only way you can claim to reduce emissions through a voluntary renewable system is to retire CO₂ allowances from the GHG market. This issue relates to the topic of allocations because the GHG program should identify whether the entity participating in the voluntary renewable program should purchase the CO₂ allowances that it retires or should receive the CO₂ allowances for free.
 - My company is currently developing a voluntary renewable program for consumers. A future mandatory GHG program should provide opportunities for voluntary renewable markets to continue to exist.
 - Additional investments in renewables can reduce the price of natural gas by reducing the demand for natural gas within the power sector. This chain of events could lead to lower electricity prices for consumers.

Process for Determining Allocations

- In addition to questions about how to design the market, we must address questions concerning who should allocate the allowances. Should Congress allocate the allowances, or should some government agency take responsibility for this task? This decision can affect what factors are addressed in the allocation scheme and can directly influence how the future market will operate.
 - In the United States, the US Congress would presumably set the cap and allocate the allowances. However, this process is very different in Europe. The Europeans have taken a bottom-up approach whereby individual member states decided the amount

of allowances that would be available and the amount of allowances that would be allocated to individual entities. This is a major complexity in the European program, and a number of lawsuits on this issue are under way.

- The US Congress has the primary authority for deciding allocation issues. The key question is whether Congress would explicitly decide the allocation program or would delegate this task to a federal agency.

Non-CO₂ Gases

- Today's discussion has focused on CO₂. What happens to an allocation system that goes across industries that emit more than one type of GHG? Should the program allocate the same CO₂ units to every gas, or should there be separate markets for every gas?
 - The Kyoto Protocol provides an example in which multiple gases are regulated at the national level based on fixed trading ratios among the gases. Also, many of the policy proposals within the United States would establish limits for all GHGs and would allow for trading among the different gases. It is important to ensure that a program requiring reductions in specific GHGs does not allow unconstrained increases in other nonregulated gases.

Mitigation Investments

- Global warming is beginning to cause real damages. Some of the value of allowances should be applied to mitigating potential future damages. In the case of the recent hurricanes, most observers agree that more investment up front would have minimized the damage caused by these events. It will be cheaper to deal proactively with some of the effects of climate change than to wait and pay for the damages after they occur.