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Greenhouse Gas Emissions Cap-and-Trade

California Air Resources Board's Preliminary Draft Regulation

Dallas Burtraw

Prepared for the California Senate Select Committee on Climate Change and AB32 Implementation

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Informational Hearing on

Greenhouse Gas Emissions Cap-and-Trade: California Air Resources Board's Preliminary Draft Regulation

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Senator Pavley, thank you for the opportunity to be here today. I am a senior fellow at Resources for the Future (RFF), a 58-year-old research institution based in Washington, DC, that focuses on energy, environmental, and natural resource issues. RFF is independent and nonpartisan, and shares the results of its economic and policy analyses with environmental and business advocates, academics, government agencies and legislative staff, members of the press, and interested citizens. RFF neither lobbies nor takes positions on specific legislative or regulatory proposals.

I have studied cap-and-trade programs for several years. I served previously on California's Market Advisory Committee, which offered guidance to the state Air Resources Board on the design of a cap-and-trade program for carbon dioxide (CO_2) emissions. I currently serve on the Economic and Allocation Advisory Committee, which will provide recommendations for the initial distribution, or allocation, of emissions allowances under a trading program.

I emphasize that my views are my own, and not those of my employer, Resources for the Future, or of the Economic and Allocation Advisory Committee on which I currently serve.

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My remarks this morning intend to provide a summary of the logic of cap and trade, how it can help the state achieve its greenhouse gas (GHG) goals, and to identify the major decisions the state will have to make in the implementation of a trading program. Perhaps foremost among these is the initial distribution of tradable allowances, and I will outline the options for this decision.

As its name implies, cap and trade has two parts. First is the emissions cap, which represents the environmental goal, as already identified in the state's GHG legislation, AB32. (Initially, at least, a trading program is likely to address only CO_2 emissions, which is the most important GHG.) The second part is trading, which is a regulatory

strategy intended to achieve that goal at less social cost than would traditional, prescriptive approaches to regulation.

In previous air quality control programs, traditional regulation often has worked well, especially where control or reduction options are limited or obvious, and where control or reduction costs are reasonable. Traditional regulation establishes what needs to be done, and prescribes how and when for each source.

There are two substantial challenges in applying traditional approaches to reducing GHGs. Because GHG emissions are ubiquitous in our economy, the informational requirements for a prescriptive approach are tremendous. To implement a traditional approach, regulators not only would have to identify opportunities for emissions reductions including innovative opportunities that have not yet been discovered but balance those efforts so that the cost of a ton of reduction from different sources is equal. If it is not equal, and low-hanging fruit is left behind, then the overall cost to the economy can grow dramatically.

The other challenge is the coordination of economic decisions throughout the rest of the economy. Even after a source makes investments and changes processes to comply, there are remaining emissions associated with its production activities. Neither the firm nor consumers of the product would pay any cost for the emissions that remain; those emissions are free. Consequently, when those consumers make their own decisions about capital purchases, such as a new air conditioner or building structure, or new equipment at another factory, they will not have a signal about the cost of emissions to the overall economy. This will cause many low-cost opportunities to reduce emissions in our economy to go unrealized and lead to investment choices that increase the overall cost of the environmental goal to society. To fix this problem, emissions must have a cost that is apparent to individual decisionmakers throughout the economy. We might call this "getting the prices right" for the entire economy.

Cap and trade resolves these problems by putting an absolute limit on the amount of emissions allowances that are available. The demand for allowances interacts with the limited supply to create scarcity, and the opportunity to trade leads to the emergence of a market price. Scarcity provides both an incentive for regulated entities to reduce emissions, in order to avoid the allowance cost, and an incentive to innovate to find new ways to reduce emissions, because an emissions allowance saved is a dollar earned.

These ideas are more than theory. They have been put into practice especially in the regulation of air pollution and can be attributed with cost savings of billions of dollars compared to traditional regulatory approaches.

Nonetheless, there are important decisions in the design of an emissions-trading program. Many of these have been addressed in the Market Advisory Committee report and in the Air Resource Board's Scoping Plan. I want to bring into focus what appear to be the most important remaining decisions.

One is monitoring and enforcement. The environmental integrity and smooth performance of the allowance market depends on monitoring of emissions; data collection; enforcement of violations, including predictable and certain penalties for violations; and regulatory oversight of secondary markets. A subsequent speaker on this panel, Ken Alex, will address this issue.

Another aspect of environmental integrity is the possibility of leakage of emissions or economic activity. There would be nothing gained, and it would seem hugely unfair, if emissions reductions in California led to increases by unregulated entities outside the state. There are two basic ways to address this problem. One is called a border adjustment, where importers of fuels that will release CO_2 or goods whose production generates high CO_2 emissions are responsible for surrendering emissions allowances. This is similar to the approach already identified in the Scoping Plan to addresses the possibility of leakage in the electricity sector, which would impose compliance responsibility on the entity that first delivers power onto the California grid. Hence, in principle, it can treat in-state and out-of-state electricity generation in a symmetric manner.

The other approach to controlling leakage is to rebate the cost of emissions allowances to producers that compete with unregulated firms. This is a provision of the Waxman-Markey bill (HR 2454) that passed the House of Representatives in June 2009. If this approach is used, it should be subject to a regular (biannual) test to show that the affected firms remain subject to unfair competition, and the amount of the rebate should be calibrated carefully to be the minimum necessary to avoid leakage. In addition, that amount can be calibrated to best practice in the industry. With these guidelines in place, I believe such an approach requires only a small adjustment to the program.

Another issue is the role for offsets, which represent the ability to count emissions reductions from outside of capped sources against emissions that are included under the cap. Michael Wara will address this issue in few minutes.

The other issue that may be the most important remaining in the design of the market is allocation—the initial distribution of the allowances. I am going to elaborate on this issue in a moment.

First, it is worth noting that there is opportunity for mischief. The program design can be made unnecessarily complicated by efforts to address special interests or to directly control the market outcome. If the point comes when the program design starts to look as thick as the Chicago phone book, one might ask what is gained by the infrastructure of the market—the state might better rely on the traditional regulatory approach. But if the program design is smart, simple, and transparent, I am convinced it can provide dramatic cost savings while helping the state to achieve its environmental goals.

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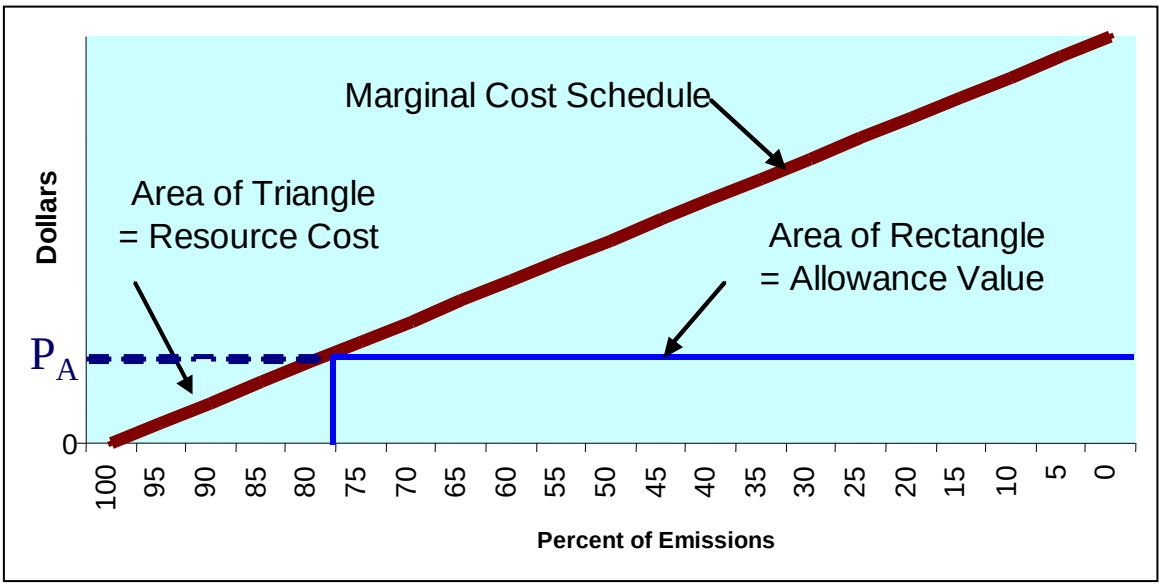
I now want to elaborate on the initial distribution, or allocation, of emissions allowances, perhaps the most important remaining issue for the design of the program because it will have large efficiency and distributional consequence. Because of this, it could affect the success of the program and indeed the political commitment to the achievement of the goals of AB32.

This figure illustrates where allowance value comes from. It is a simple representation of how the allowance price is achieved in the market. The horizontal axis displays the reduction in emissions, which fall from 100 percent of baseline levels as one moves from left to right. The vertical axis is dollars. The upward sloping curve is the schedule of cost-effective measures for achieving emissions reductions. The first measure costs almost zero, and moving left to right the incremental cost increases as one achieves greater emissions reductions.

Figure 1: Allowance Value under a Cap-and-Trade Program



The picture depicts an arbitrary point where emissions are reduced to about 75 percent of baseline levels. The figure illustrates that the cost of the incremental measure determines the price of allowances in the market. At a higher price, firms would be willing to achieve additional emissions reductions instead of buying allowances, and, at a lower price, firms would buy allowances and increase their emissions, rather than incur the cost of reducing emissions. The sum of the incremental measures taken to achieve emissions reductions up to this point is represented by the triangle under the curve.

The value of emissions allowances is determined by the price of allowances multiplied by the number of allowances that remain in the program, or the rectangle illustrated in the figure. It is apparent that for the emissions reduction targets that will be achieved over the next couple of decades, the value of allowances is substantially greater than the actual resource costs to society. Nonetheless, under a cap-and-trade program, consumers will

have to pay both of these costs, including the resource cost triangle and the larger allowance cost rectangle. It is essential to note that the triangle represents the resources used to achieve emissions reductions that are lost to the economy, but the allowance value rectangle is a payment for "environmental services" that is not lost to the economy. It is a transfer among entities in the economy, and who receives this value is the core question of allocation that we are addressing.

The magnitude of the asset value would be tremendous. The value of emissions allowances under a CO_2 trading program dwarfs the size under previous programs. Nationally, the distribution of this value would be the largest newly created federally enforced property right in the United States since the 19th century. Also on a national scale, it would total over $100 billion per year, and would grow over time reaching up to $400 billion per year. In California, under AB32, and in the absence of a federal program, the value is expected to be between $7 billion and $20 billion per year over the next decade.

As I noted, the Economic and Allocation Advisory Committee will offer guidance in its forthcoming report, and I am not going to anticipate those recommendations. Here, I can introduce the taxonomy of choices that are available generally, and offer some rationale for each.

In previous trading programs, most of the allowance value has been given for free to incumbent emitters, an approach known as **grandfathering**. However, over the last several years, important evolution in the thinking about the use of cap and trade for CO_2 regulation has called into question free allocation to emitters.

Free allocation to firms represents free allocation to owners or shareholders. Some may feel owners deserve compensation for lost value from climate policy. However, return to investment occurs because owners take risks. Some owners will have made investments to reduce their emissions already that give them advantages relative to other parties, but the incentive do so is undermined if the allocation is used to compensate others that have not made similar investments. Further, the mechanisms for delivering compensation through free allocation to firms are very imprecise. Firm ownership changes hands over time; shareholders at the time of passage of AB32 may not be the shareholders today. Moreover, the substantial majority of costs (perhaps 88 percent, according to various studies) will be passed on to consumers through higher product prices, and not born by firms themselves.

One way to direct value back to **consumers** would be free allocation to regulated or publicly owned companies. California's two energy regulatory agencies, the Public Utility Commission and the Energy Commission, issued a joint recommendation in 2008 to the Air Resources Board that endorsed allocation to local distribution companies. Advocates of this approach feel that it would help soften the increase in electricity prices. A disadvantage is that consumers would then not appreciate the cost of CO_2 emissions, and they would have less incentive to make investments to reduce their own emissions.

So, other sectors of the economy would have to achieve more emissions reductions, raising the overall cost of the program.

Moving beyond the idea of free allocation to firms, the allocation decision falls along two lines. One is to use the money to **invest** in programs that would help the state's economy to transition to a low-carbon future. Part of this strategy could involve investments to help disadvantaged communities through a community benefits fund, but other entities might also play a role including local governments, schools, community-based organizations, or utility local distribution companies. Many opportunities for such investment exist.

The other line of thinking is to return the value to **individuals**, and there are two prominent approaches to achieve this. One would be to pay **dividends** on a per-capita basis. An example is the Alaska Permanent Fund, which gives to each individual who has resided in the state for over a year a share of the state's oil and gas revenues, averaging around $1,300 per year. Advocates of this approach invoke the philosophical and economic perspective that the atmosphere is a common property resource, and we all share equally in the harm resulting from its degradation. Per-capita dividends are seen as payment for services to the owners of the resource. Also, this approach would be especially easy to communicate to the general public.

The second way value could be returned to individuals or households would be through reduction in **marginal tax rates**, including income taxes or sales taxes. The use of allowance value to fund specific government programs or to reduce the state's deficit would also fall into this category, if tax rates would decrease in the future. Advocates of this approach point to strong evidence from economic theory and modeling that the reduction in marginal tax rates could help the economy to grow and substantially reduce the overall cost of climate policy. This would benefit everyone in the state. However, a disadvantage is that the benefits would fall unevenly across the income distribution. Since high-income households face higher marginal income tax rates and pay more taxes generally, they may be most likely to benefit from this approach. Consequently, one might want to couple this approach with other forms of compensation for low-income households.

These approaches are not exclusive. The state could decide to construct a hybrid, with some investment and some value returned to individuals. Moreover, returning value to individuals through dividends or tax reform could be coupled with policies to encourage households to make their own program-related investments. This might occur by providing a tax advantage if the funds are used for qualified investments or allowing households to borrow future year dividends or tax returns for such investments.

In summary, each option has some justification. Also, there are legal constraints, which others are better suited to address than me. In my view, one very important criterion for this decision is that it be transparent and not masked in a complicated formula that may be perceived to serve private interests. That transparency will help to build trust in public policy to address the challenges associated with climate change.