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To: Dr. Lawrence H. Goulder, Chair, and Mr. Richard Frank, Esq., Vice Chair
Economic and Allocation Advisory Committee
California Environmental Protection Agency

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Re: The Scope and Options for the Economic and Allocation Advisory Committee

California faces many challenges in accomplishing the goals of reducing the State's greenhouse gas (GHG) emissions, as set out in the California Global Warming Solutions Act of 2006 (AB 32). To help address these challenges, the California Environmental Protection Agency and the Air Resources Board (CARB) created the Economic and Allocation Advisory Committee. The Committee's task is to "advise on the implementation of AB 32 and the associated cap-and-trade system," particularly on the allocation of GHG emissions allowances and the design and use of CARB's revised economic analysis of the AB 32 Scoping Plan. In this memorandum, we offer some suggestions on how the Committee might approach these important issues.

Design and Use of CARB's Economic Analysis

One of the Committee's tasks is to provide guidance to CARB as it develops its revised economic analysis of the AB 32 Scoping Plan. As we described in our critiques of CARB's original economic analysis, CARB should not conduct its analysis merely to justify a pre-determined set of policies. Rather, its analysis should play a central role in identifying and designing policies that can effectively fulfill AB 32's environmental goals while minimizing adverse consequences for California's economy. To serve this function, not only will the economic analysis need to use appropriate methodologies and assumptions, but it will also need to carefully compare alternatives to arrive at a set of policies that achieves targeted emission reductions at minimum cost. To these ends, we encourage the Committee to provide advice to CARB on how best to use economic analysis in the implementation of AB 32, including:

- How can CARB improve its economic assessments of potential AB 32 policies and better use this information to inform the design of important policy elements of a state cap-and-trade system (e.g., scope of coverage, point of regulation, and the use of offsets) and to inform the choice and design of policies that might complement a state (or federal) cap-and-trade system?
- How can CARB better assess certain unintended consequences of potential AB 32 policies, including emissions leakage and risks to economic competitiveness?

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- What are the implications for environmental- and cost-effectiveness of overlap between different AB 32 policies or overlap between particular AB 32 polices and existing or future federal policies? How should potential AB 32 policies be modified in light of these interactions?
- How should CARB alter the design, implementation, and/or timing of its cap-and-trade system in light of progress in the development of federal climate change policy?

Allocation of GHG Emission Allowances

The Committee has also been charged with providing CARB with guidance on how to allocate GHG emissions allowances and how to use auction revenue if some portion of the allowances is auctioned. The agenda for the Committee's first meetings identifies a number of key questions that should be considered in choosing a mechanism for allocating allowances. Below, we suggest a framework for approaching these questions and provide some preliminary thoughts on answers to them.

CARB (or the appropriate government agency) has two basic options for distributing allowances. One option is to distribute emissions allowances for free. Free allocations can be set in fixed quantities that are determined prior to program implementation. While previous cap-and-trade systems have set such allocations based on sources' historical activities (e.g., emissions levels), economic theory provides no rationale for preferring one method for determining a fixed allocation over another. (These are, in the language of economics, distributional matters, not matters of greater or lesser cost-effectiveness. This is not to suggest that they are unimportant, but simply that economics does not provide unambiguous guidance favoring a particular allocation formula.) Free allowances can also be allocated in varying quantities that depend on firms' most recent levels of economic activity (e.g., production output). Such an allocation method – often referred to as an updating, output-based allocation – has potential advantages (reducing leakage) and potential disadvantages (increasing aggregate costs of compliance). We discuss them below.

CARB can also auction emissions allowances. When auctioning allowances, an important decision is determining how auction revenue will be used. The options for using auction revenue are potentially wide ranging, although legal factors may limit some of them. We discuss several options – and their implications for aggregate costs and distributional matters – below.

Given these two options, CARB must also determine the portion of allowances to freely distribute versus the portion of allowances to auction. It is important to recognize that CARB can change the proportions of allowances that are freely distributed and auctioned over time. For example, it can distribute most emissions allowances freely at the beginning of the program before transitioning to a 100 percent auction in later periods.

We encourage the Committee to consider the implications of each allowance allocation mechanism along three dimensions: **environmental effectiveness, total social costs**, and **distributional consequences**. For the most part, the choice of allocation mechanism has limited impacts on environmental effectiveness and total costs, although there are several important caveats. In any event, allocation choices are likely to have important consequences for distributional outcomes.

Environmental Effectiveness

In most circumstances, the allocation mechanism has no effect on the achievement of GHG emission targets and therefore no effect on the environmental effectiveness of the cap-and-trade program. The allocation decision does not directly affect the stringency of the cap, nor does it affect the final distribution of allowances among covered sources. The chosen allocation mechanism only affects how sources initially receive allowances and how much (if anything) they initially pay for them. Therefore, as

long as California limits GHG emissions by imposing an economy-wide cap, the allocation of emission allowances will not affect the achievement of environmental goals.

One caveat is worth mentioning. An updating output-based allocation mechanism might reduce the likelihood of emissions leakage from industrial sectors receiving such allocations. By acting as a subsidy to production, updating output-based allocations tend to lower production costs in those industries receiving allowances, which would reduce the incentive for production to shift to regions outside the cap. This could improve the environmental effectiveness of the program. (There is also an economic problem with this mechanism, however, which we identify below.)

Total Social Costs

As with the impact of allocation choice on environmental effectiveness, under many scenarios, the allocation mechanism will not appreciably affect the cost-effectiveness of the cap-and-trade program – that is, the GHG emissions target will be achieved at the least social cost. The cap-and-trade program will achieve its intended environmental goals by encouraging the lowest-cost emissions reductions available irrespective of how CARB allocates allowances. Because, in most cases, the choice of allowance mechanism does not affect the marginal incentives to reduce emissions created by a cap-and-trade system, the choice of allocation mechanism will not alter firms' decisions regarding the choice of measures used to reduce GHG emissions. Likewise, because firms, for the most part, will make the same pricing and production decisions irrespective of how they obtain allowances, the choice of allocation mechanism will not affect the price signals sent throughout California's economy that will encourage the use of less GHG-intensive goods and services. As a result, a cap-and-trade program will, under most circumstances, be cost-effective, regardless of the mechanism used to distribute allowances.

However, three very important caveats must be noted. First, it is widely anticipated that local distribution companies (LDCs), the regulated utilities that deliver electric power, will be required to pass along the value of freely allocated allowances to their customers. If LDCs use the value of freely allocated allowances to reduce per kWh electricity rates, then consumers would face less of an incentive to reduce their electricity consumption and to invest in energy conservation. This would necessitate that more costly emission reductions be undertaken elsewhere in the economy to meet the cap, which would increase the total costs of achieving the cap.

Second, as noted above, an updating, output-based updating allocation mechanism has the effect of subsidizing production. Because this subsidy can distort prices in industries receiving allowances, consumers may not face the appropriate incentive to reduce their consumption of GHG-intensive goods and services. Therefore, just as with free allocations to LDCs, updating output-based allocations may necessitate that potentially more costly emission reductions be undertaken elsewhere in the economy to meet the cap. This too would increase the total costs of achieving the cap.

Third, on the one hand, allowance auctions *can* reduce total social costs compared to a program that freely distributes allowances if the revenue from the auction is used to reduce other social costs or to provide social benefits. On the other hand, allowance auctions could – in principle – *increase* the total costs of the cap-and-trade program or have no net effect at all. The actual impact on total costs depends critically on how the auction revenue is used.

Certain uses of auction revenues could lower AB 32's total social costs. Most striking, auction revenue could be used to reduce existing marginal tax rates (although there may be legal hurdles to such a use in California). This use of auction revenues would lower the social costs associated with distortions in labor and investment decisions created by existing marginal taxes. This would lower the overall social costs of achieving the AB 32 cap.

However, lowering marginal tax rates differs in important ways from returning the value of allowances to California taxpayers through a lump-sum carbon rebate (or "dividend"), as Governor

Schwarzenegger has proposed. A lump-sum carbon rebate would compensate consumers for some of the impact of higher prices, but it would not lower social costs because it would fail to remove any of the economic distortions created by the tax system.

Auction revenue could also be used to subsidize or fund beneficial public programs, such as certain research and development efforts into advanced, low-carbon technologies. When such programs are designed to overcome certain *market failures*, such as well-recognized impediments to optimal levels of investment in research and development, the programs may be more likely to be socially beneficial. On the other hand, auction revenue could be used to fund public projects of limited value, where the benefits of the projects do not exceed the costs. This would increase the total social costs of the cap-and-trade program.

Many other uses of auction revenue would have an ambiguous effect on total social costs. For example, CARB could use auction revenue to compensate businesses particularly affected by AB 32 policies. As with the Governor's proposed lump-sum carbon "dividend," this use of auction revenue would benefit certain subsets of Californians, but would not have a clear positive or negative effect on social costs.

CARB could also use auction revenue to achieve other AB 32 policy goals, such as providing co-benefits through pollution reductions in disadvantaged communities. The net effect of this option on social costs is also ambiguous, because it would depend on whether the benefits of those localized pollution reductions exceed the costs of achieving them.

In sum, there is no guarantee that the use of revenue from allowance auctions would reduce the total costs of meeting the emissions cap compared with a program that freely distributes emissions allowances. The impact on total costs of employing an allowance auction depends completely upon how CARB elects to use the auction revenue and how those impacts compare with what the value of the allowances could be used for in the private sector.

Distributional Consequences

Allocation decisions can clearly have important distributional consequences, depending on who receives free allowances (if any) and what programs and policies are funded by allowance auction revenue (if any). To understand these distributional outcomes, it is important to recognize that the choice of allocation mechanism can have important consequences for the way in which allowance value is transferred to different groups in the economy. For example, the value of freely distributed, fixed allowance allocations typically accrue to those firms (and their shareholders) that receive them. However, for the most part, fixed allocations would not affect firms' production decisions and thus would not help California avoid the economic impacts of climate policy, including reductions in employment and price impacts on consumers.

By contrast, an output-based updating allocation mechanism might avoid decreases in output and employment in certain sectors that would occur under climate policy, but it would provide firm shareholders with limited financial compensation (particularly compared to fixed allocations). It would also shift the distribution of employment impacts across different sectors of the economy and shift the distribution of consumer price impacts across the range of goods and services in the economy. For example, relative to a fixed allocation, output prices would fall in sectors receiving updating allowances, but would rise for other sectors of the economy.

These distributional implications can also depend on particular circumstances of the recipients of free allocations. For example, the value of freely distributed, fixed allowance allocations to regulated utilities are likely to be passed through to their consumers through lower electricity rates, whereas allowances

distributed through such an allocation to other industrial sectors would not necessarily be passed through to their customers.

As with free allowance allocations, the beneficiaries of an allocation mechanism that auctions allowances depends on how those auction revenues are used. For example, the use of auction revenues to fund residential energy efficiency programs will support businesses and employment that provide energy services to households. Of course, offsetting the economic benefits to these particular sectors is the overall burden on the economy imposed by the cap-and-trade system.

By clarifying the tradeoffs in the choice of allowance allocation mechanism, economic analysis can help inform and guide policymakers as they make these important decisions.