Comments on stakeholder meetings for AB 32, California Air Resources Board:

"Emissions Leakage Issues in a Cap-and-Trade Program," April 13, 2009

"Criteria for Compliance Offsets in a Cap-and-Trade Program," April 28, 2009

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Emission leakage is driven by differential costs between regulated and unregulated industries; therefore cost control is critical to minimizing leakage. In a cap-and-trade system, costs are significantly impacted by the method of allocation (of either allowances or auction revenue) and also by offsets, so the three issues of leakage, allocation, and offsets need to be considered together.

Regulated industries face two types of costs: Emissions are subject to a carbon price, and emission abatement involves technology costs. Emission-reduction measures will generally not be adopted if the abatement cost exceeds the emission price, so abatement costs are, on average, less than the carbon price, and they tend to decrease over time as abatement technologies develop and achieve economies of scale. If allowances are auctioned or sold, almost all of an industry's regulatory cost can initially come from emission charges while abatement technology has not yet been widely commercialized. The high costs can divert financial resources for abatement technology, reduce industry competitiveness, create leakage, and perhaps make meaningful regulation politically unviable.

Industry costs can be substantially reduced by employing free allocation, or equivalently, by refunding auction revenue to industry. (Free allocation is tantamount to giving out the cash value of those allowances.) A "grandfathering" allocation formula gives preference to emitting firms, but auction revenue can alternatively be distributed according to an "output-based" formula that does not discriminate against renewable energy, and which reduces industry costs without reducing regulatory incentives for emission abatement.

The output-based approach can be illustrated in the context of electricity generation. (The same method would be applicable to other industries, such as cement[1], where commercially viable abatement technologies exist.) In the context of electricity, regulated entities would incur emission charges based on the prevailing carbon price ($/MTCO2) and would receive an output price subsidy based on a uniform rate ($/MWh) that is determined to maintain revenue neutrality.

A limitation of this type of pure output-based approach for electricity is that initially most of the net revenue flow would go to legacy hydro and nuclear energy, not to new renewables that need capital expansion financing. However, industry costs could be further reduced, without diminishing incentives for new renewable generation, by

[1] http://www.worldchanging.com/archives//001610.html
http://www.worldchanging.com/archives//003151.html

initially excluding legacy hydro and nuclear from the allocation. As new renewables gain market dominance the system could gradually transition to pure output-based allocation.

Suppose, for example, that new renewables comprise 10 percent of the allocation market. Then a $1/MWh net charge on fossil fuel energy could support a $9/MWh renewable-energy subsidy. Fossil-fuel energy (making up 90 percent of the market) would incur an average carbon emission charge equivalent to $10/MWh; renewables would incur no emission charge; and both would receive the same $9/MWh subsidy. The $10/MWh price advantage of new renewables would not be affected by the subsidy.

Output-based allocation would be of limited utility in high-emission industries that do not have commercially viable abatement technologies. In this case, allowance auction revenue might be applied to commercial substitutes (e.g., revenue from domestic air transport could finance high-speed rail construction). Or it could be applied to fund R&D efforts to develop abatement technologies (e.g. aviation biofuels). Economic contraction in the regulated industry would, to an extent, be counterbalanced by increased economic activity that results from revenue expenditures. But the revenues should be applied specifically to the development and commercialization of low-carbon alternatives to the processes and products that generated the revenues, because high carbon prices alone will not feasibly induce emission reductions on the scale required for climate stabilization. Attempts to reduce industry's emissions without finding low-cost, low-emission alternatives will tend to be undone by leakage. Furthermore, allocation of the revenue for other purposes would make the beneficiaries of the revenue shift perversely dependent on continued GHG emissions, and the diverted revenues might also directly or indirectly drive leakage.

Auction revenue can be used for a variety of purposes such as mitigating industry's costs, subsidizing clean tech, and helping low-income consumers; but out-of-state offsets reduce funds that are available for these purposes. This diversion of funds increases statewide regulatory costs, and it can also operate against regulated industries' own interests. This can be illustrated by referring back to the previous output-based allocation case in which emitting firms incur a $10/MWh carbon fee and receive a $9/MWh subsidy.

For the purpose of illustration, suppose that no limit is placed on offsets, and suppose that a particular firm is able to meet its entire compliance obligation by purchasing out-of-state offsets at a price of $5/MWh. If the firm has a small market share, it will not significantly affect the aggregate revenue from the allowance auction, so the output-based subsidy will still be approximately $9/MWh, and the firm that bought the offsets would reap a net gain of $4/MWh. But if all regulated firms were to follow the same strategy of replacing $10/MWh allowances with $5/MWh offsets, then the auction revenue pool would be depleted. Fossil-fuel energy would incur a $5/MWh compliance cost with no compensating subsidy, compared to a net cost of $1/MWh with no offsets. (Moreover, renewables would receive no subsidy and would lose half of their price advantage.) Thus, the offsets would induce industry firms, each acting in its own interest, to collectively act in a manner that is against their self-interest.

This situation could be avoided by limiting output-based subsidies for firms that rely on offsets. For example, if a firm uses offsets for a certain percentage of its compliance obligation, then its subsidy allocation could be reduced by the same percentage. However, this might neutralize the benefit of offsets to regulated firms. Compared to offsets, output-based allocation can be a much more potent cost-reduction mechanism and may obviate the need for offsets.

Irrespective of whether allowances are all auctioned or whether output-based allocation is employed, the broader point is that offsets do not necessarily reduce statewide costs, because a lower emission price does not necessarily imply lower cost. A $5/MWh carbon price, with all revenue being exported out-of-state, would not necessarily be less costly to the state than a $10/MWh price, with all revenue being applied to support local industries, jobs, and rate payers. Thus, out-of-state offsets would not necessarily "minimize costs and maximize the total benefits to California" as required by AB 32, Sec. 38562(b)(1). Furthermore, unless and until ARB has performed quantitative statewide economic modeling of offsets, a cap-and-trade implementation plan employing offsets will not comply with Sec. 38561(d), which requires ARB to "evaluate the total potential costs and total potential economic and noneconomic benefits of the plan for reducing greenhouse gases to California's economy, environment, and public health, using the best available economic models, emission estimation techniques, and other scientific methods."