Comments for AB 32 Scoping Plan Workshop of July 17, 2008, relating to the Draft Scoping Plan[1]

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These comments pertain to the "Carbon Fee", which is identified in the Draft Scoping Plan[2] as one of the "Other Measures Under Evaluation"; see pages 41-43 (and also Appendix C, pages C-181 - C-182).

CARB is evaluating carbon fees as an alternative to cap-and-trade, but disfavors carbon fees on the grounds that "they provide less certainty in California's ability to meet specific emission targets, as required under AB 32" (Draft Plan, page 42). However, carbon fees and cap-and-trade are neither mutually exclusive nor incompatible policy options. A carbon fee would provide *greater* certainty of meeting California's AB 32 goal, and could incentivize early action in advance of post-2020 regulations, if it is implemented as a price floor in the context of cap-and-trade (i.e., as a reservation price in an allowance auction).

A carbon fee is effectively a fixed-price sale of emission allowances. In a cap-and-trade system with a price floor, no allowances are sold below the reservation price; and as long as some allowances remain unsold the auction is also effectively a fixed-price sale. A price floor is a hybrid policy instrument, which is equivalent to a pure auction when the reservation price is zero, and is equivalent to a pure carbon fee when the cap is higher than business-as-usual emissions.

A price floor would allow regulators to both cap emissions and also guarantee a minimal incentive for emission reductions, preventing the kind of price erosion or collapse that occurred with the U.S. Acid Rain program and the EU ETS. To the extent that the price incentive induces early action and over-compliance with the cap, it could significantly reduce the cost of achieving post-2020 emission reductions. (Pricing instruments can theoretically be at least five times more cost-efficient than inflexible caps for achieving long-term emission targets.[3]) Thus, a price floor would be responsive to the AB 32 mandate requiring CARB to "Design the regulations … in a manner that … seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions."[4] If the price floor is based on a cost-effectiveness criterion it would also be responsive to the mandate requiring "the maximum technologically feasible and cost-effective greenhouse gas emission reductions …"[5].

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[1] [http://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm]
[2] [http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.htm]
[3] Policy Options for Reducing CO2 Emissions, Congressional Budget Office, February 2008 [http://www.cbo.gov/ftpdocs/89xx/doc8934/toc.htm]
[4] AB 32 [http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf], Sect. 38562 (b)(1).
[5] AB 32, Sect. 38560.

The AB 32 Scoping Plan not only applies to California's 2020 goal, but will also establish a regulatory policy framework for post-2020 action and will set a precedent for national and international regulatory policy. The merits of a price floor should be considered in this broader context.

The U.S. Acid Rain program illustrates the pitfalls of cap-and-trade when no price floor is imposed. The program's compliance costs have been much lower than anticipated when it was enacted in 1990, but the health and environmental costs of SO2 emissions, and the need for further emission reductions, have also been found to be vastly greater than expected. The Bush administration and EPA have been trying to strengthen the regulations, but have been unable to get new rules past the congress and the courts – even when projected benefits include the prevention of 17,000 premature deaths per year[6].

Had a price floor been imposed at the original price expectation level, the SO2 program's goals could have been achieved much sooner and probably without any need for supplemental legislation or rules such the Clean Air Interstate Rule, which EPA adopted in 2005 after the Bush administration failed to get congressional support for its alternative Clear Skies initiative. CAIR was struck down by a federal appeals court in July, 2008, and SO2 trading prices have subsequently collapsed. This experience has clear implications for GHG regulation, which will need to need to reduce emissions by an order of magnitude beyond AB 32's 2020 limit to attain climate sustainability. An over-reliance on caps, without any price controls, could result in endless political and legal deadlock and regulatory uncertainty as states, the federal government, and other countries try to impose ever more stringent caps. A price floor, by contrast, would motivate the market to apply the benefits of technology advancement and economies of scale to further reduction of emissions without continual regulatory intervention.

Allowance auctions and carbon fees (or taxes) have not gained political acceptance in the U.S. because of their comparatively high regulatory costs relative to cap-and-trade with free allocation. As noted in the Draft Plan (page 41), "For every $10/metric ton, the fees would increase the wholesale price of coal-fired electricity by $0.01 per kilowatt-hour, of gasoline by $0.10 per gallon, and natural gas by $0.05 per therm." By contrast, a $10/ton trading price under cap-and-trade would not typically result in such costs, and low-emission generators could *profit* from trading because allowances are typically freely allocated. However, any proportionate allocation formula for free allowance distribution can be equivalently applied to the distribution of fee or auction revenue (i.e., rather than giving a regulated entity X percent of the allowance distribution, it would instead get X percent of the revenue), so there is no reason why carbon fees or auctions need impose higher regulatory costs than free allocation.

A fee-type policy employing "free allocation" is exemplified by the Swedish program for stationary-source NOx emissions. The program imposes fees on NOx emissions, and it refunds practically all of the fee revenue to regulated entities in proportion to "useful energy output", e.g., MWh for electricity. (The same output-based refunding method would be applicable to an allowance auction, either with or without a

[6] [http://www.epa.gov/interstateairquality/basic.html]

price floor.) Since the dollar-per-MWh refund is the same for high- and low-emission energy, it does not impact their relative competitiveness, but it greatly diminishes regulatory costs.

Theoretical objections to fees and free allocation notwithstanding, the Swedish program's real-world performance speaks for itself and suggests a viable policy approach for GHG regulation:

> "In the two years between the approval and the activation of the Act on NOx, many companies began extensive efforts to reduce emission levels in anticipation of the charges they would face in 1992. … Overall, the Swedish NOx feebate policy can be described as having surpassed the best expectations set when it was introduced in 1992. Emission levels have plunged much faster than was ever anticipated, with the 35% reduction target set for 1995 (from 1990 levels) achieved two years early in 1993. Thanks to the rebate system, for many firms the installation of NOx-reducing equipment has been a profitable venture."[7]

> "Although the charge system only became official in 1992, steps to reduce emissions of nitrogen oxides had actually started to be taken two years earlier, after the passing of a bill in Parliament in June 1990. Between 1990 and 1995 specific emissions from the affected plants dropped from an average of about 160 milligrams of NOx per megajoule (mg/MJ) of useful energy to 60 mg/MJ, or by about 60 per cent. The total from all plants did not come down quite as much, however, the reduction being more like 50 per cent – since the total output of energy had in the meantime increased by almost a quarter."[8]

> "… The Swedish retrofitted unit, in contrast, demonstrates that NOx levels well below the Swedish standard (and also below the German or United States standards) are achievable. … The Swedish regulatory system, incorporating an economic incentive, clearly motivates [the Swedish plant] to achieve minimal NOx rates rather than just comply with the applicable emission standard."[9]

> "… the fact that polluters are more likely to accept [Refunded Emission Payments] than taxes may be a decisive factor for the political viability of the regulation. An NOx tax, corresponding to the current Swedish NOx charge level of $5,000/ton … would have given an output effect of only 2–

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[7] Barg, S., Duraiappah, A., Exan, V. E., 2000. Economic Instruments for Environmental Policy Making in Ontario. International Institute for Sustainable Development (pp. 48–50) [http://www.ene.gov.on.ca/envision/ergreport/downloads/report_paper2.pdf]

[8] Ågren, C., 2000. Nitrogen oxides: emissions charge works well. Acid News 2, 1–4 [http://www.acidrain.org/pages/publications/acidnews/2000/AN2-00.pdf]

[9] (USEPA), 1997. Performance of Selective Catalytic Reduction on Coal-Fired Steam Generating Units. U.S. Environmental Protection Agency, Office of Air and Radiation. page 37 [http://www.epa.gov/airmarkets/progsregs/arp/docs/scrfinal.pdf]

> 3% of total current output. … In this example, the output effect is much less important than the abatement effect."[10]

> "A charge was set at 40 Swedish kronor (SEK) per kilogram of NOx emitted. This corresponds to 6000 USD/ ton, which can be compared to permit prices that are usually in the hundreds of dollars (although occasionally higher) in the US programs for NOx permits. The few other countries in Europe that have NOx fees, like France, Italy and Galicia in Spain, all have fee levels of about 150 USD/ton or less …"[11]

> "… With the rebate, however, a similar calculation finds a price rise of less than $0.0004 per KwH. This is one-fifth the rise without a rebate, or an increase in price of between 0.5 and 1.0 percent if Swedish electricity sells for $0.05 to $0.10 per KwH. … the actual price rise was not of much practical concern."[12]

It is notable that the Swedish program's lack of "environmental certainty" resulted in significantly *greater* – not less – emission reductions than were anticipated. Had a traditional cap-and-trade system been employed, it would have only achieved the targeted 35% reduction in 1995, much less than what would be economically justifiable and politically acceptable. On the other hand, cap-and-trade with a price floor would have both guaranteed a minimal 35% reduction while also incentivizing greater (e.g., 50%) reduction.

Another lesson of the Swedish program is that emission taxes (and similarly, allowance auctions) need not impose higher regulatory costs than caps and standards. Moreover, high regulatory costs are not necessarily beneficial for either consumers or environmental interests. Without the refund, the high NOx emission price (and corresponding high abatement incentive) would not have been politically viable. In the context of GHG regulation, the combination of high competitive incentives in the low-carbon energy market, and low regulatory costs, could help maintain energy supplies and keep consumer prices low more effectively than simply giving consumers the tax revenue.

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[10] Sterner, T., Hoglund, L., 2000. Output-Based Refunding of Emission Payments: Theory, Distribution of Costs, and International Experience. Discussion Paper 00-29. Published by Resources for the Future. page 6 [http://www.rff.org/RFF/Documents/RFF-DP-00-29.pdf]

[11] Isaksson, L., Sterner, S., 2006. Refunded emission payments theory, distribution of costs, and Swedish experience of NOx abatement, in: Ecological Economics 57 (1), 93-106. [http://dx.doi.org/10.1016/j.ecolecon.2005.03.008]

[12] Wolff, G. H., 2000. When Will Business Want Environmental Taxes? Redefining Progress. page 6 [http://www.redefiningprogress.org/newpubs/2000/etr_business.pdf]