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Ms. Mary Nichols, Chair
Air Resource Board
1001 I Street,
Sacramento, CA 95814

Subject: Proposed Regulation to Implement the AB 32 Cap-and-Trade Program

Dear Chairwoman Nichols,

I thank the Air Resources Board (ARB) for the opportunity to comment on the draft cap-and-trade rule proposed by the ARB as a part of its AB 32 Scoping Plan. The steps the ARB is taking to develop a cap-and-trade system as a part of the Scoping will determine whether California can achieve AB 32's 2020 greenhouse gas (GHG) target in the most cost-effective fashion and to providing important leadership on the design of effective climate policy. With many states, provinces and nations monitoring the ability of California's climate policies to balance environmental and economic outcomes as they decide whether to undertake policies to reduce GHG emissions, ARB's decisions potentially influence the course of climate policy outside its borders.

My comments will address four issues:

1. The Allowance Reserve;
2. Other decisions that can provide cost containment;
3. Transparency of emission cap calculations; and
4. Mechanisms to address emission leakage.

Allowance Reserve

The ARB's proposed rule includes several provisions designed to help contain costs. These provisions are important not only for California, but for broader efforts to design effective climate policies. Given the political headwinds faced by climate policy in the U.S., ARB can provide valuable leadership by demonstrating that climate policy incorporating appropriate designs and safeguards can achieve important environmental benefits without undue risk to .the economy. Design of an effective California cap-and-trade program can also go a long way to eliminating emerging misconceptions about the value of market-based mechanisms to achieving these goals.

Along with three-year compliance periods, allowance banking and the use of allowance offsets, ARB's proposed rule includes an Allowance Reserve ("Reserve") which is designed to help moderate allowance prices. The Reserve works, in effect, by increasing the supply of allowances when allowance prices rise to the level at which they can be purchased from the reserve ("Reserve trigger prices"). Accounting for forecast inflation, Reserve trigger prices will rise to $68, $76, and $85 per metric ton (MT) by 2020.[1]

While the Reserve is likely to mitigate the potential for high allowance prices, its proposed design raises several concerns. First, the Reserve is stocked by increasing the cap's stringency by 1% in the first Compliance Period, 4% in the second Compliance Period, and 7% in the third Compliance Period. These are significant increases in cap stringency, particularly in the third compliance period. While the limit on offset use has been relaxed so as to exactly equal the increased cap stringency, the proposed changes

[1] Estimates reflect forecast inflation based on the GDP Chain Price Index used in EIA's 2009 Annual Energy Outlook.

significantly increase reliance on offset markets. If offsets become a low-cost source of emission reductions, then the increased cap stringency may not raise costs appreciably. However, if offsets are either in short supply or are more costly than anticipated, then the ARB's proposed changes could actually raise costs, particularly (although not exclusively) during periods when allowances are below Reserve trigger prices. A Reserve design that relies less upon increasing cap stringency would reduce the risk that the Reserve raises – rather than contains – costs.

Second, the proposed Reserve does not completely eliminate the risk that allowance prices rise to unacceptably high levels. If the Reserve is exhausted, then allowance prices could rise well above the trigger prices established by ARB. In fact, as the Reserve becomes depleted, uncertainty about the risk of Reserve exhaustion and subsequent high allowance prices could lead to speculation that accelerates Reserve exhaustion.

ARB has alternatives available to address these concerns, many of which have been mentioned in prior comments.[2] First, ARB could design the Reserve to hold a (roughly) constant, but smaller, quantity of allowances. To maintain a "steady-state" quantity of allowances, the Reserve could be replenished with additional allowances as it becomes depleted. One approach to replenishing the Reserve is to use revenues from the sale of Reserve allowances to purchase emission offsets.[3] Another alternative for replenishing the Reserve is to borrow allowances from post-2020 commitments periods.[4] Both of these alternatives can maintain environmental integrity of the policy.

By replenishing the Reserve so that it contains a (roughly) constant quantity of allowances at all times, the Reserve does not need to be initially stocked to provide cost containment for *all* contingencies over the period 2012 to 2020.[5] [6] Thus, replenishment allows a smaller Reserve to be maintained, which reduces the quantity of allowances that is required to initially stock the Reserve. Compared to ARB's proposed Reserve, this approach provides two advantages. First, it provides a sufficient supply of allowances to address all market contingencies, and, second, it avoids the need to significantly increase the stringency of emission targets in order to stock the Reserve.

In addition to incorporating mechanisms that replenish the Reserve, ARB could also employ alternative approaches to initially stocking the Reserve. For example, ARB could initially fill the Reserve with a mix of allowances from under the cap and offsets. Allowances from under the cap could be used

[2] For example, *see* Comments of Todd Schatzki, The Design of Cost Containment Mechanisms for the AB 32 Cap-and-Trade System, Submitted to the California Air Resources Board, July 13, 2010.

[3] I understand that ARB has concerns about any mechanism in which the Reserve purchases offsets, since this would make ARB both an issuer and purchaser of offsets. While appreciating ARB's concern about the independence of these functions, I would encourage ARB to consider alternative institutional designs (e.g., purchase of offsets from an Offset Project Registry) to create appropriate independence between these functions that could allow the use of these alternative Reserve designs, particularly given their potential economic benefits.

[4] Assuming ARB would carry forward allowances in the Reserve to post-2020 commitment period, this approach borrows from post-2020 compliance periods in an analogous manner to the way ARB proposes to initially stock the Reserve.

[5] In fact, a failure to reduce Reserve size if the Reserve is to be replenished could place too much demand on uncertain and evolving offset markets.

[6] Because ARB's proposal would stock the Reserve only once, it is both larger than necessary to address contingencies at any one point in time and too small to address all contingencies that may arise over the period 2012 to 2020. In fact, any attempt to establish a Reserve capable of addressing all market contingencies over an extended period is bound to be unsuccessful. While ARB relies on scenarios that consider partial effectiveness of complementary policies to determine the best size for the Reserve, it fails to consider other uncertainties that might also raise demand for Reserve allowances, including higher economic growth, drought conditions (that reduce hydroelectric output), limited offset supplies and other contingencies (e.g., unanticipated nuclear plant outages.)

to initially stock a smaller Reserve than is proposed by ARB, and the Reserve could be gradually expanded through offset purchases.[7]

Mechanism for Selling Allowances from the Reserve

ARB should consider the following modifications to its proposed mechanism for selling Reserve allowances:

1. Allow each buyer to submit a maximum quantity of allowances that it is willing to purchase at each Reserve sale; and
2. Automatically reduce bid quantities if a bid would lead the buyer to exceed its Holding limit.

These modifications would address problems that may arise with the proposed Reserve sale mechanism due to the potential that a buyer receives only a portion of her bid for allowances in Tiers that become exhausted in the current sale. These potential problems are best illustrated through an example. Suppose a buyer wishes to purchase 100 allowances up to the prices of the current Tier 2 price (e.g., $60 per MT.) As illustrated below, each of her options for submitting bids raises problems that the first modification resolves:

> **Option 1: Bid for 100 allowances from the Tier 1 Reserve.** If the Tier 1 Reserve becomes exhausted during the auction, she receives only a fraction this bid and purchases less than 100 allowances.
>
> **Option 2: Bid for 100 allowances from the Tier 1 Reserve (at $53 per MT) and for 100 allowances from the Tier 2 Reserve.** She is guaranteed to purchase at least the 100 allowances she needs, but likely purchases more than she needs, and, moreover, may end up paying for higher priced Tier 2 allowances when Tier 1 allowances are still available.
>
> **Option 3: Bid for 100 allowances from the Tier 2 Reserve.** She likely gets the 100 allowances she needs (and no more), but must unnecessarily pay for most costly Tier 2 Reserve allowances to ensure she gets the right quantity.

By contrast, with the proposed modifications, she is able to purchase exactly the quantity of allowances desired at the lowest price (i.e., her share of Tier 1 allowances and enough Tier 2 allowances to give her a total of 100 allowances.)

Another problem arises if bids exceed buyer holding limits. Returning to the example, suppose the buyer's account is 150 allowances below her holding limit, and she receives 80 allowances from her Tier 1 bid. If her Tier 2 bid is also for 100 allowances, then her entire bid will be rejected since it would exceed her holding limit. Instead, ARB should simply reduce the bid amount to 70 allowances (=150 – 80) to allow the buyer to meet their demand for allowances up to their holding limit.

Other Decisions that Can Provide Cost Containment

ARB includes several provisions aimed at achieving AB 32's 2020 GHG target that the lowest possible cost. However, other provisions inadvertently raise costs, or create the risk of higher costs. Re-consideration of these provisions could lower the cost of achieving AB 32 GHG targets.

First, the proposed rule moves allowances that are not sold in the allowance auction to Tier 3 of the Reserve. Instead, costs could be reduced by shifting unsold allowances to the next auction. If economic and or market circumstances change such that allowance prices rise, these allowances would be

[7] These purchases might be made gradually to avoid driving up offset prices at any given point in time.

unavailable to help satisfy demand, thus raising costs until allowance prices rise to the Tier 3 price triggers.

Second, ARB proposes to enforce the 8 percent limit on offset use for each three-year Compliance Period.[8] However, depending upon conditions in offset and allowance markets, it may be uneconomic to use the full extent of offset flexibility offered in certain compliance periods. For example, if offset markets are slow to initially develop, complying entities may find it more cost-effective to rely upon emission reductions from sources under the cap, rather than offsets. However, costs might be lowered if complying entities are allowed to carry forward and even trade these "rights" to use offsets. A simple accounting mechanism that keeps track of the quantity of offsets each complying entity is allowed to use could allow them to bank and even trade these "rights" to use offsets. Such a mechanism may also lower costs by allowing firms to specialize in their use of offsets. Given the fixed administrative costs of effectively participating in offset markets, this flexibility could allow some firms to avoid these administrative costs (which could be large for smaller complying entities), while not foregoing the opportunity to achieve compliance cost savings.

Transparency of Emission Cap Calculations

The proposed rule and Initial Statement of Reasons ("ISOR") fail to provide details on the calculations used in arriving at key elements of the rule, including the Annual Budget Amounts (with and without allowances placed in the Reserve), the cumulative offset use limit, and the calculation of amounts placed into the Reserve. It is particularly important to provide a clear description of the calculation resulting in the 8.5 percent reduction in the 2020 allowance cap from that identified in the Scoping Plan (365 MMT) to that identified in the Rule (334.2 MMT)..

Leakage

ARB's proposed rule includes provisions designed to address emissions leakage and avoid disadvantaging California business. The primary tool for addressing leakage is output-based allowance allocations for "Industry Assistance." The proposed rule includes formulas that determine the quantity of allowances allocated to industry participants in each year. Under these formulas, assistance will decline over time due to changes in the "assistance factor" and the "adjustment factor". In addition, ARB decisions about the "emissions efficiency benchmark" for each sector will also affect the extent to which industry assistance neutralizes the effect of the cap-and-trade system on firm competitiveness.[9] Neither ARB's proposed Rule nor the ISOR indicate the criteria to be used in developing these benchmarks.

The quantity of allowances granted to firms in a given sector, as specified by these formulas, varies depending upon that sector's vulnerability to leakage. ARB faces several difficult challenges as it tries to identify sectors potentially vulnerable to leakage. A sector's vulnerability to leakage in the short-run and long-run can depend upon many factors, including market structure, industry cost structure, market trends, demand responsiveness and preferences, constraints on competition from other geographic regions, industry investment opportunities and constraints, and the magnitude of the regulatory cost or

[8] The proposed rule would also enforce the 8 percent offset limit for each Annual Compliance Obligation. ARB should clarify whether complying entities would be permitted to use offsets, such that their total offset use was no more than 8 percent for each three-year Compliance Period irrespective of the quantity of offsets used in fulfilling its Annual Compliance Obligation.

[9] For example, a benchmark set at the average sector emission rate would (on average) offset the impact of the cap-and-trade system. By contrast, a benchmark based on the most efficient facilities or firms would (on average) only partially offset the impact of the cap-and-trade system.

constraint. However, fully accounting for all of these factors not only requires significant data but requires analyses tailored to each industry's particular circumstances.

Faced with limited resources and data, ARB has proposed to use emissions intensity and trade share to measure vulnerability to leakage, while recognizing the limitations of these metrics. For example, the ISOR notes comments made by the Australian regulator regarding "... the importance of supplemental qualitative analysis when trade share is used due to the uncertain indication of cost pass-through ability."[10]

Because GHG- and trade-related metrics do not provide a perfect measure of an industry's vulnerability to leakage, some cap-and-trade programs propose that regulators may consider factors other than the formulas and conditions used to identify emissions-intensity and trade-exposure to identify vulnerable sectors.[11] Under the EU ETS, the list of sectors "deemed to be exposed to a significant risk of carbon leakage" may be supplemented by taking into account the extent to which individual facilities can reduce GHG emissions or electricity use, future projections of market conditions, and firms' profit margins.[12] In Australia's Carbon Pollution Reduction Scheme, sectors may apply for assistance by arguing that they have "a demonstrated lack of capacity to pass through costs due to the potential for international competition."[13] Similarly, ARB has indicated that it will "continue to develop techniques to evaluate the trade exposure of various industries."[14]

As ARB considers these alternative techniques, it may want to consider supplemental assessments reflecting both quantitative and qualitative information about a sector's vulnerability to leakage. These assessments might better capture leakage risks for industries in unique circumstances. Use of such assessments typically requires clear and well-defined criteria and methodologies and transparent procedures for review to ensure that determinations are consistent across sectors, reflect objective, independent analysis and reflect true industry vulnerability. Ensuring adequate procedural safeguards can place an additional administrative burden on the program. Despite these complications, such assessments may be warranted given data limitations for measuring GHG- or trade-intensity at the state level, and may provide ARB with information on the extent to which its emissions-intensity and trade-exposure metrics have accurately captured leakage vulnerability of industries within California.

As ARB further analyzes how to most effectively address leakage, several issues are worth considering. First, prior efforts by regulators to design mechanisms to address leakage were developed within the context of national programs. However, leakage as a consequence of AB 32 may occur due to both international and interstate trade. As discussed in a prior paper, there is substantial reason to believe that trade vulnerability may be greater under these latter circumstances.[15] Consequently, as ARB develops criteria for trade vulnerability, it might attempt to more explicitly account for these differences, particularly since it has relied largely upon metrics developed in the context of national programs addressing leakage from only international trade.

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[10] ISOR, Appendix K, p. K-17.

[11] ARB also acknowledges this, stating that: "Staff has concluded that while the trade share metric may provide us with an approximate relative order of potential competition across the various sectors, it may not be sufficient to accurately quantify the degree of exposure to competition for many sectors." ISOR, Appendix K, p. K-27.

[12] Directive 2003/87/EC of the European Parliament and of the Council, as amended, October 13, 2003, Article 10a(17).

[13] Australian Government, "Establishing the Eligibility of Activities Under the Emissions-Intensive Trade-Exposed Assistance Program," June 2009, Section 4.2, p. 24; see also, Australian Government, "Carbon Pollution Reduction Scheme: Australia's Low Pollution Future," Policy position 12.6, p. 12-31, http://www.climatechange.gov.au/publications/cprs/white-paper/cprs-whitepaper.aspx.

[14] ISOR, Appendix K, p. K-27.

[15] *See* Stavins, Robert N., Jonathan Borck and Todd Schatzki, "Options for Addressing Leakage in California's Climate Policy," February 2010.

Second, as with other mechanisms used and proposed for addressing leakage, the level of assistance is insensitive to the level of allowance prices. However, the level of allowance prices is one of the primary determinants of vulnerability to emission leakage. Examining compliance costs in the petroleum refinery sector illustrates this issue. When allowance prices are $10 per MT, the additional costs on the petroleum sector refining would be roughly 1.0 cents per gallon. By contrast, when allowance prices are $85 per MT, the additional costs would be roughly 8.1 cents per gallon.[16] By contrast, transportation costs for refined petroleum range from 3 to 12 cents per gallon depending upon the point of origination.[17] [18] Thus, the magnitude of the incremental costs faced by California business as a result of the cap-and-trade program depends closely upon actual allowance prices. In light of this sensitivity, ARB might consider mechanisms that adjust that rate at which allocations for Industry Assistance are phased out for depending upon the level of allowances prices.

Again, I thank ARB for the opportunity to submit comments to the proposed AB 32 cap-and-trade rules.

Sincerely,

Todd Schatzki[19]

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[16] These calculations assume emission rate of 9.57×10^{-4} MT CO_2e per gallon based on data from ARB and the California Energy Commission.

[17] U.S. Department of Energy, Energy Information Administration, *2003 California Gasoline Price Study Final Report*, November 2003, Table 2-1.

[18] Note that this example compares only two of the factors – allowance and transportation costs – that would affect actual leakage. As noted previously, actual leakage would depend upon many other sector-specific factors.

[19] Todd Schatzki is a Vice President at Analysis Group. He is an expert in energy and environmental economics and policy, and has performed research and written extensively on the design of climate and energy policy, and the economic analysis of climate and regulatory policy. He received a Ph.D. in Public Policy from Harvard University. These comments were prepared at the request of the Chevron Corporation. While Chevron provided funding for the development of these comments, they reflect independent assessment by Dr. Schatzki, and do not necessarily reflect the views of Chevron.