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June 17, 2008

Mr. Kevin Kennedy, Chief
Program Evaluation Branch
Office of Climate Change
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: **AB 32 Implementation – Scoping Plan - Cost-Effectiveness**

Dear Mr. Kennedy,

The Western States Petroleum Association (WSPA) is pleased to submit the following comments on "cost-effectiveness" in regard to the Scoping Plan, which was discussed during the June 3, 2008 workshop and its accompanying CARB White Paper. WSPA is a non-profit trade association representing twenty-six companies that explore for, produce, refine, transport and market petroleum, petroleum products and natural gas in six western states – California, Arizona, Nevada, Oregon, Washington and Hawaii. WSPA member companies own and operate various types of facilities (e.g., oil and gas production properties, refineries, marketing terminals, pipelines, retail gasoline outlets, etc.) that will all be impacted by the implementation of AB 32.

Executive Summary
WSPA agrees with CARB that cost-effectiveness is important to the adoption of the Scoping Plan. However, we have some concerns with the initial staff proposal.

Professor Sweeney's presentation provides a very useful distinction between "instruments" and "measures."[1] It is not at all clear in the White Paper whether staff is developing a plan that achieves a specified reduction in GHG emissions or is weighing the costs and benefits of different options. The cost-effectiveness of CARB's GHG regulations will depend *both* on the specific emission reductions that are targeted and on the policy instruments that are employed to achieve those reductions. The proposed "bundled" approach is limited with respect to its ability to assess both determinants of cost-effectiveness.

Our most serious concern is that the proposed 'bundled' approach will not provide CARB with the critical insights that are necessary to evaluate the cost-effectiveness of alternative *policy instruments* for achieving emission reductions from particular sources. Hence, the 'bundled' approach cannot

[1] Reviewing, "measure" means a physical or process change to be undertaken, e.g. adoption of plug-in hybrid vehicles; "instrument" means a system to motivate the measures, e.g. minimum sales mandate or cap-and-trade system.

adequately inform key policy decisions for the scoping plan. The White Paper prematurely focuses on selecting measures before deciding what type of instruments might be preferable, e.g., prescriptive command-and-control or market-based.

CARB's approach to making cost-effectiveness determinations also does not account for and/or recognize key implications of the fact that GHG emissions (and emission reductions) will have the same impact on climate change in California regardless of where in the world they occur. In particular, CARB's White Paper does not address how its proposed approach will be influenced by the varied impacts that alternative Californian emission reduction measures will have on GHG emissions outside of California through "emissions leakage." The approach also does not address how its cost-effectiveness determinations will be influenced by the ability to achieve identical climate-related benefits through emission reductions outside of California (e.g., offsets).

Many measures will simply shift GHG emissions to other out-of-state locations, thus failing to achieve the expected environmental benefits. These are critical assumptions that must be included in the analysis. Its absence has led to the exclusion of proper cost-effectiveness analyses of leakage and the use of offsets as compared with a California-centric assessment.

Finally, we urge CARB staff to remain **very cautious in allowing its cost-effectiveness determinations to be influenced by estimates of co-benefits from reductions in "co-pollutants,"** While inclusion of co-benefits (and co-detriments) may be appropriate for cost-effectiveness analysis, it is important to include the *universe* of such co-factors rather than selectively including only ones that may be easily identified or that have sponsors**.**

I. An Appropriate Evaluation of Cost-Effectiveness Is Critical

WSPA believes that the "cost-effectiveness" evaluation will be one of the most critical elements of the Scoping Plan and will be critical to the implementation of AB 32. The importance of cost-effectiveness is made apparent by considering just how much is at stake in implementing AB 32 — and therefore how important it is to cost-effectively achieve AB 32's target. Meeting AB 32's target is expected to require annual emission reductions of about 175 $MMTCO_2e$ by 2020 (see below).

Therefore, even if the failure to adopt the most cost-effective policies only increases average emission reduction costs by $5 per ton (on average), this seemingly small impact would, in total, impose nearly $1 billion in unnecessary annual costs on California's economy. CARB staff acknowledges the importance of adopting cost-effective policies and highlights that "it is extremely unlikely that the ambitious target called for under AB 32 could be met with strategies having a negative or zero cost."[2]

II. Proposed Cost-Effectiveness Evaluation Will Not Inform on Cost-Effectiveness of Scoping Plan Policy Options

At the April 25, 2008 CARB Workshop you and your staff very accurately and comprehensively outlined and discussed all the competing evaluation criteria that are required by AB 32 as you develop the Scoping Plan. At the May 19, 2008 workshop, you indicated that the probable approach for the Scoping Plan would involve achieving 60% (or 105 $MMTCO_2e$) of the needed emission reductions via core measures consisting of traditional regulatory approaches, and that the remaining 40% (70 $MMTCO_2e$) would be achieved from a menu of other options that may include any or a combination of the following:

1) Additional traditional regulatory approaches such as command and control, performance standards, etc;

[2] White Paper, page 13.

2) Cap-and-trade and/or
3) Carbon fees

In the coming months and years, CARB must evaluate the cost-effectiveness of these three policy options, or mix of options, and make critical choices in developing and implementing the Scoping Plan under AB 32. Most notably, it must identify the right combination or mix of the various options under consideration. As highlighted in the Part III below, we do not believe that the proposed cost-effectiveness evaluation approach will adequately inform on the potential policy options outlined by CARB at May 19, 2008 workshop.

III. Staff's Proposed Approach Cannot Inform Decisions Regarding the Most Cost-Effective Policy Instruments for Targeting Particular Emission Reduction Measures

The June 3, 2008 workshop discussed the "cost-effectiveness" criterion as a tool for making these critical policy choices. Unfortunately we are very concerned that Staff's proposed approach cannot inform decisions regarding the most cost-effective policy option for targeting particular emission reduction measures. The cost-effectiveness of CARB's GHG regulations will depend *both* on the specific emission reductions that are targeted and on the policy instruments that are employed to achieve those reductions. Over 80 percent of California's GHG emissions could be incorporated effectively under a statewide market-based policy, such as a cap-and-trade program or carbon fee.[3]

Therefore, in designing regulations, a critical decision before CARB is whether it should achieve particular emission reductions through direct (prescriptive/command and control) regulation, or if it instead should rely on a statewide market-based policy, such as a cap-and-trade or carbon fee, to elicit those very same emission reductions.[4] This decision requires a determination of whether direct command and control regulations targeting emission reductions from particular sources would be more or less cost-effective than relying on a cap-and-trade to achieve reductions from those very same sources.

For example, in considering the possibility of establishing direct regulations to reduce refinery GHG emissions, CARB must consider whether it would instead be more cost-effective to rely on cap-and-trade to elicit all such emission reductions from refineries. Unfortunately, Staff's proposed approach to assessing cost-effectiveness would be completely uninformative in assisting CARB's determination of which regulatory approach (or policy instrument) would be more cost-effective.

For example, the fact that a direct regulation could reduce refinery emissions at a cost per ton that falls within the range of the "Cost of a Bundle of Strategies" does not offer any insight as to whether the same amount of refinery emissions could be reduced at an even lower cost under a cap-and-trade system. As a result, comparison of the direct regulation's cost per ton with the "Cost of a Bundle of Strategies" is not sufficient to determine if the regulation is cost-effective.

In assessing the cost-effectiveness of direct regulation relative to the alternative of relying more heavily on a cap-and-trade approach, the body of economic research strongly supports starting from the presumption that a cap-and-trade approach will be more cost-effective. There are at least two reasons why this is the case.

[3] Market Advisory Committee to the California Air Resources Board, *Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California*, June 2007, p. 32.

[4] For simplicity, from here forward, this discussion will focus on a cap-and-trade as the potential market-based approach, rather than referring to the possibility of either a cap-and-trade or carbon fee.

First, in order for CARB to identify those direct regulations that are truly cost-effective, it would first need to identify and correctly calculate the cost of *all* possible emission reduction measures that could contribute to achieving AB 32's 2020 emissions target. Only then can it determine which subset of those measures could achieve AB 32's target at least cost. Obviously, this is an impossible task that highlights the preference that should be given to relying on a cap-and-trade system. Such a system introduces a price signal that allows the numerous emitters of GHGs to individually determine which measures will (and which will not) contribute to meeting AB 32's target in the most cost-effective manner possible. Indeed, experience with the SO_2 cap-and-trade program for U.S. electric utilities highlights how some of the least costly emission reduction measures may not be identified by regulators *ex ante.*

Second, any projections of the cost of particular regulations will turn out to be wrong because of the simple fact that key determinants of those costs cannot be perfectly predicted. Putting aside the difficulty of properly measuring the full social cost of certain emission reduction measures given current information, measures that appear cost-effective today may turn out to be far from cost-effective ten years from now as fuel and technology costs change and other lower-cost opportunities emerge. Therefore, direct regulation may lock us into certain emission reductions that appear cost-effective today, but turn out not to be cost-effective in 2020. By contrast, one of a cap-and-trade system's virtues is that it allows regulated entities the flexibility to adjust their emission reduction strategies in response to unanticipated developments in the cost of alternative emission reduction measures.

In light of the above, it is critical that CARB's cost-effectiveness determinations carefully consider the following questions in order to assess the cost-effectiveness of any direct regulations that would target emission sources that could be included under a cap-and-trade system:

- Is there any reason to believe that the reductions targeted by direct regulations would not be adopted voluntarily by firms under a cap-and-trade system if those reductions do turn out to be cost-effective? That is, why are the direct regulations believed to be more cost-effective than relying on a cap-and-trade system? Is there a better way to just adjust market-based measures, such as providing low-interest loans to overcome market barriers?
- If there is such a reason, do the gains from targeting those reductions through direct regulation outweigh the relative costs and risks of direct regulation, as compared with a cap-and-trade system? Are the distribution of impacts from applying a gross instrument such as direct regulation inequitable compared to the more efficiently distributed impacts from a market-based instrument?

A few different factors should be considered in addressing the second question:

- Proceedings to establish direct regulations can impose substantial administrative costs and can take considerable time. These costs and time commitments are incurred with each additional emission reduction measure that is targeted and with each effort to increase the stringency of existing measures. By contrast, while a cap-and-trade system may take significant "fixed costs" to establish, the aggregate level of emission reductions achieved by the system can be adjusted by simply ratcheting down the cap, an action that entails effectively no incremental administrative costs. In addition, by creating a "private right" in emission reductions tied to the credits, this encourages development of a third-party monitoring system that better ensures that emission reductions are real and valid.
- Even if direct regulations that impose uniform standards are, on average, cost-effective for the entire population, they often require emission reductions that are *not* cost-effective for some portion of the regulated population. By contrast, a cap-and-trade provides more flexibility for regulated firms to adopt particular emission reduction measures in those circumstances where the

measures are cost-effective, and to adopt alternative strategies in those circumstances where those same emission reduction measures would not be cost-effective.

- The reductions gained through a market-based system are cost-effective by definition for each individual agent or firm if the market is properly designed to capture the relevant decision factors. An agent or firm will compare the cost of reducing its own individual emissions against the market signals issued by all other regulated firms and choose those measures that best fit its own individual circumstances.
- Direct regulation presents a risk that is not present in a cap-and-trade system. If unanticipated developments cause a particular emission reduction measure to no longer be cost-effective under direct regulation, regulated entities may nonetheless be locked-in to undertaking that measure. By contrast, under a cap-and-trade system, regulated entities have the flexibility to shift their emission reduction strategies in response to unanticipated developments.

Addressing the above questions requires a fundamentally different focus in evaluating the cost-effectiveness of particular regulations than that proposed by the staff. Simply developing a best estimate of a cost per ton of emission reductions is insufficient to the task. Thus, the staff needs to develop a new and different strategy for evaluating the cost-effectiveness of alternative policy instruments not *just* measures, for achieving emission reductions from particular sources.

IV. The Staff Has Not Adequately Addressed How Its Proposed Cost-Effectiveness Evaluation Will Account for Various Forms of Leakage

The Staff compares its cost-effectiveness approach to the approach historically used to evaluate the cost-effectiveness of criteria pollutant measures. But there is a fundamental difference between GHGs and criteria pollutants that must be accounted for in the staff's approach. In particular, the benefits to the citizens of California resulting from GHG emission reduction measures depend on those measures' *net impact on global* GHG emissions, not just on their direct impact on California's GHG emissions.

In the case of criteria pollutants, reducing one ton of emissions in California yields the same environmental benefits to Californians regardless of whether or not that reduction is offset by increased emissions in, for example, New York. By contrast, the benefits of GHG emission reduction measures to Californians depend fundamentally on those measures' net impact on global GHG emissions. Thus, assessments of the cost-effectiveness of GHG emission reduction measures must determine the extent to which those measures reduce *global* GHG emissions, not just the extent to which they reduce Californian emissions.

Various forms of emissions leakage can diminish the extent to which Californian emission reduction measures reduce global GHG emissions. Concern about leakage in the electricity sector has been widely discussed, but other industrial sectors also may be prone to leakage. For example, impacts of California climate policy on competitive dynamics in some sectors, such as the petroleum sector, may cause some of the emission reductions in those sectors to be offset by increased emissions outside of California as production activity shifts out-of-state in response to new regulations. Moreover, interactions between state and federal regulations could facilitate leakage in response to certain state regulations.

For example, with the new federal fuel economy regulations established by the Energy Independence and Security Act of 2007 (EISA), Californian regulations that effectively require improvements in California vehicle fuel economy (such as under AB 1493) may be prone to substantial emissions leakage. Federal regulations will require auto manufacturers to significantly increase the average fuel economy of the vehicles that they sell in the United States. With these federal regulations in place, while Californian regulations may lead to even greater improvements in fuel economy among vehicles

sold in California — thereby reducing California's GHG emissions — those state regulations will reduce the extent to which manufacturers must improve the fuel economy of vehicles sold in the rest of the United States in order to meet the average nationwide fuel economy standards established under EISA. Therefore, the net effect of such Californian regulations on global GHG emissions may be substantially less than the regulations' direct effects on California's own GHG emissions.

Likewise, the new federal renewable fuels requirements enacted under EISA will create the potential for substantial leakage associated with any Californian regulations bringing about increased in-state use of renewable fuels (e.g., under the low carbon fuel standard).

In light of the above, in making cost-effectiveness determinations, CARB needs to be clear as to how it will account for the effects of these various forms of leakage in its cost-effectiveness determinations. To some, the implications of existing (or future) federal regulations for the cost-effectiveness of California's emission reduction efforts may seem to be only an academic concern. This is far from the case. Of the many emission reduction measures that CARB will need to decide among, some may impose real costs to achieve real reductions in *both* Californian and global GHG emissions. On the other hand, other measures that impose similar costs and achieve similar reductions in Californian emissions may simply have the effect of redistributing, rather than reducing, global GHG emissions. It is critical that CARB's cost-effectiveness determinations account for and reflect such differences among the regulatory options before it.

V. Proposed Approach Fails to Explicitly Address the Implications of Global GHG Emissions Offsets for Cost-Effectiveness Determinations

Reductions in GHG emissions have the same effect on global GHG concentrations and subsequent climate change regardless of where in the world those reductions are achieved. Therefore, reductions in GHG emissions can generate the same climate-related environmental benefits for California regardless of where in the world those reductions are achieved. Thus, just as a GHG emission reduction measure cannot be considered cost-effective if there is a less costly untapped means of reducing GHG emissions within California, that same measure cannot be considered cost-effective (from the standpoint of limiting global climate change) if a less costly untapped means of reducing GHG emissions exists anywhere else in the world.[5]

The White Paper fails to discuss how its cost-effectiveness determination will be influenced by the fact that firms can achieve the same reduction in global GHG concentrations by achieving a given reduction in GHG emissions either inside or outside of California. In fact, the White Paper appears to suggest that only the cost of alternative emission reduction opportunities *within California* will be considered in assessing the cost-effectiveness of proposed regulations. Yet, contrary to the proposed approach, the option of reducing GHG emissions outside of California must be considered in order to coherently assess the cost-effectiveness of state regulations that are intended to mitigate *global* climate change.

[5] The existence of "environmental co-benefits" is often offered as a reason to require more GHG reductions in California even when there are less costly opportunities to reduce GHG emissions outside of California (such as through offsets). Yet, the proposed cost-effectiveness calculation would account for any such co-benefits in calculating the per-ton social cost of each GHG emission reduction measure. Thus, with these co-benefits accounted for, if CARB's calculated per-ton cost of a particular GHG regulation is higher than the per-ton cost of reducing GHG emissions outside of California, this would imply that the regulation would not be cost-effective even if one considers the co-benefits foregone by choosing to reduce emissions outside of California. Put another way, this would imply that Californians could realize the same environmental benefits (with respect to *both* GHGs and co-pollutants) at less cost if some of the GHG emission reductions were instead achieved outside of California, and other measures were used to achieve comparable reductions in co-pollutants within California.

In this regard, the White Paper misses the mark in discussing the relevance to its cost-effectiveness determination of the European Union's Emissions Trading Scheme (EU ETS) allowance prices and the Clean Development Mechanism's (CDM) credit prices. Staff correctly notes that those prices may not reflect the per-ton costs that would need to be incurred to reduce emissions to 1990 levels through California-only measures. Yet, Staff fails to recognize that those prices *do reflect* the maximum per-ton cost that Californian emission sources would need to incur to achieve the same climate-related benefits as would be achieved by meeting AB 32's statewide 2020 emissions target.

Californian emission sources may be able to achieve substantial reductions in Californian GHG emissions at lower cost. But, if any remaining emission reductions in California have costs that are above the EU ETS allowance price or the CDM credit price, it would be less costly for Californian sources to simply buy and retire EU ETS allowances or CDM credits, rather than achieve the remaining costly reductions within California .

Buying and retiring EU ETS allowances or CDM credits would achieve the same reduction in global emissions at a lower cost than would be incurred if all remaining emission reductions were achieved within California.[6] . Thus, a regulation that requires Californian sources to reduce emissions at a cost above the market prices of EU ETS allowances or CDM credits would not be a cost-effective means of reducing GHG emissions. This is because the regulation's environmental benefits could be achieved at a lesser cost by simply requiring the targeted firms to purchase a quantity of EU ETS allowances or CDM credits that is comparable to the reductions anticipated from the contemplated regulation.

As the above example demonstrates, the Staff needs to revisit the role that market prices from existing allowance and credit markets should play in its cost-effectiveness determinations, given that these prices reflect the maximum cost at which Californian sources could immediately and easily achieve reductions in global GHG emissions.

VI. CARB Should Be Very Cautious in Allowing Its Cost-Effectiveness Determinations to Be Influenced by Estimated Co-Benefits

Staff proposes to consider a variety of offsetting "savings" or "benefits" in calculating the net social cost of particular GHG emission reduction measures. For example, in the case of energy efficiency investments, these offsetting savings would include any long-run fuel savings resulting from the investments. For energy efficiency and other emission reduction measures, the net social cost also may be reduced by "co-benefits" from associated reductions in co-pollutants resulting from reducing GHG emissions.

Further, for a given regulation, CARB would benefit from developing more than one cost-effectiveness assessment, where the assessments differ with respect to the types of co-benefits that are included. Moreover, CARB should be very cautious in allowing such estimated co-benefits to swing its determination of the cost-effectiveness of particular GHG emission reduction measures. There are at least two reasons why this is the case. First, unlike the capital costs and (in some cases) the resulting fuel savings from particular GHG emission reduction measures, a measure's environmental co-benefits can be far more challenging to measure accurately. Second, and more importantly, the

[6] One might argue that the EU ETS and CDM prices do not reflect what the true cost would be if those markets were mature and fully functioning. However, if the risk posed climate change is to be addressed to the extent that many are calling for, these and other markets ***must*** become fully functioning markets. If they do not, California's efforts will be for naught. This important linkage must always be at the forefront of any discussion about implementing AB 32. The beauty of relying on market-based instruments is that the standard for establishing cost-effectiveness will adjust automatically as these other markets develop.

exercise that CARB is embarking on in implementing AB 32 is the identification and evaluation of *GHG* emission reduction measures. In the context of AB 32, CARB cannot attempt to (and is not attempting to) undertake an exhaustive assessment of all measures that reduce *other non-GHG* emissions.

Therefore, it may be the case that a particular GHG reduction measure that appears cost-effective largely on the basis of its co-benefits is actually *not cost-effective* when compared with the option of adopting other GHG reduction measures that do not yield appreciable environmental co-benefits *in combination with* other measures that specifically target the co-pollutants of concern, *but do not* yield meaningful GHG reductions. Further, measures may have other non-air quality or non-environmental co-benefit or co-detriments, such as reductions in mobility, destruction of wetlands, or disproportionate economic impacts on low-income populations.

Again, market-based instruments automatically choose the most cost-effective measures given constraints on other factors such as environmental impacts. Moving towards maximizing the "net benefits" of a multi-factor problem creates the need to conduct a comprehensive cost-benefit analysis, which is not contemplated in AB 32. The appropriate approach is to allow individual agents and firms to make choices within a set of constraints that reflect the state's many social goals.

The lesson here is that, by allowing its assessment of GHG regulations to be swayed by considerations of effects on co-pollutants, and by doing so without simultaneously undertaking a comprehensive assessment of *all* means of reducing those co-pollutants (regardless of whether or not those means also reduce GHG emissions), the ARB may end up with a portfolio of regulations that are neither the most cost-effective means of reducing GHG emissions, nor the most cost-effective means of reducing emissions of co-pollutants. For this reason, if a contemplated GHG regulation appears cost-effective when one considers its environmental co-benefits, but does not appear cost-effective without those co-benefits, this should be a signal that much more careful study is needed to determine if the regulation should be adopted. In particular, such additional study should examine if there are more cost-effective means of achieving the twin goals of reducing GHG emissions and reducing emissions of the other co-pollutants of concern.

VII. CARB Must Remain Focused on Using the Full Suite of Tools in Conducting the Cost-Effectiveness Analysis

Several other considerations are important in conducting cost-effectiveness assessments. Any useful cost-effectiveness analysis must address how to incorporate uncertainty about future costs, simply because we can be sure that we will be wrong about costs—we just don't know which direction and by how much. Most existing studies have seriously outdated cost assumptions, especially considering the recent run up in the cost fuel and energy. For example, additional information is critical on the following elements of a robust cost-effectiveness analysis:

- Future costs and emission reductions must be properly discounted. If emission reductions are not discounted, then the analysis ignores the financing costs (i.e., interest payments), that the acting parties will incur. While this may not seem intuitively obvious, it can be demonstrated to be true mathematically.[7] If the discount rate applicable to benefits is thought to be different than those for costs, then cost-benefit, not cost-effectiveness, analysis is the appropriate tool.[8]

[7] For example, take a measure that costs $100 per ton per year for a 30-year period, and assume a single ton reduction each year. The net present value of the cost at a 5% discount rate is $1537. If we simply sum the emission reductions over the 30 years (i.e., 30 tons) and divide the discounted cost by this amount, we arrive at $51.24 per ton. On the other hand, if we divide the discounted cost by the net present value of the emission

- Uncertainty associated with proposed measures, policies and programs should be explicitly called out, with outcome ranges used to illustrate possible pathways. We cannot accurately predict the future. This implies that our analyses should reflect that uncertainty, and we should be honest with decision makers about the potential range of outcomes. For example, uncertainty levels could be framed by using the full range of cost estimates developed by different parties in the proceeding so long as the data, methods and assumptions can be made transparent.

- Another is to incorporate the inherent uncertainty contained in the underlying data and parameter assumptions. This approach is being effectively and coherently applied in electricity resource planning, and the California Energy Commission (CEC) is undertaking a project to explore additional analytically robust means of addressing uncertainty into its planning processes.

- A description of the differences in key assumptions that drive estimates (e.g., discount rates, fuel price forecasts, demand responsiveness) must be presented. It should be possible for one analyst to take key assumptions and replicate the results from another model.. This transparency is key to identifying and understanding the critical drivers of uncertainty.

- Additional caution must be applied in assessing findings of so-called "negative-cost reductions." Several cost studies have suggested that no- or negative-cost GHG emissions reductions are readily available in the market place through emission reduction measures such as energy efficiency improvements. We agree that energy efficiency is an area to which we must all pay additional attention. But a recent Cambridge Energy Research Associates analysis cautions that the leading studies that find "negative-cost" reductions lack a proper market context, and imply a deeply flawed capital market.[9] In particular, in assessing the possibility of negative-cost reductions, it is critical to question why these reductions have not taken place previously, and to carefully examine what barriers stand in the way of achieving these reductions, in order to ensure that the true cost of the measure has been properly calculated.

Governor Schwarzenegger's vision is to have California's AB 32 lead the world to a new carbon free era. To lead, California's program must be cost-effective, practical, technically feasible, and have minimal impact on energy supply and the state's economy. These various features are critical in order for California's program to provide the world with the confidence that is needed to follow California's example. We urge that you consider our comments on cost-effectiveness.

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reductions (i.e., 15.37 tons), the cost is $100 per ton—the same at the annual cost. (Note that this latter answer is the same as when we calculate the levelized cost using the PMT function in the Excel spreadsheet program.)

[8] These issues are discussed further in Steven J. Moss,, Richard J. McCann, and Marvin Feldman. "A Guide for Reviewing Environmental Policy Studies." Sacramento, California: California Environmental Protection Agency, 1995.

[9] Lawrence J. Makovich, "The Cost of Energy Efficiency Investments: The Leading Edge of Carbon Abatement," Cambridge Energy Research Associates, Inc. 2008.

If there are any questions, please do not hesitate to contact me at (916)498-7752.

Sincerely,

cc: Dan Dunmoyer
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