

October 30, 2008

California Air Resources Board  
c/o California EPA  
1001 I Street  
Sacramento, California 95812

Dear Air Resources Board:

We at CRA, International appreciate the opportunity to submit our comments on the ARB's Economic Analysis Supplement on the Climate Change Draft Scoping Plan (September 2008). CRA, International is a worldwide management, economics and financial consulting firm. We have been analyzing the economic impacts of alternative designs for California's climate policies since Governor Schwarzenegger issued Executive Order S-3-05.<sup>1</sup>

First, we commend the ARB for recognizing that their current economic analysis of their proposed measures represents the beginning, and not the end, of this process.

Our primary suggestion is that the ARB needs to expand its economic analysis to include different models and approaches and not rely primarily on its current modeling efforts. In particular, the ARB's current modeling efforts conclude that their Preliminary Measures will produce emission reductions while saving consumers money. That is, that implementation of these measures will not have significant economic costs and, in fact, will produce positive overall economic benefits.

This result directly contradicts the findings of much of the recent analysis on the economic impacts of climate change policies. For example at a recent EPRI Modeling Workshop ("*Understanding Model Estimates of the Economic Costs of Climate Change Policy*," May 2008), the model results of a number of different analysts (including the American Council for Capital Formation, Clean Air Task Force, CRA, Energy Information Agency, US EPA, and MIT) showed under a wide range of assumptions that the economic costs to complying with the federal Lieberman-Warner bill exceeded the benefits.

None of the studies found the large economic benefits that appear in the California studies, despite the fact that a nationwide program can avoid many of the competitive and leakage effects of a state-level program. Comparing results for the year 2020, the percentage change in emission reductions

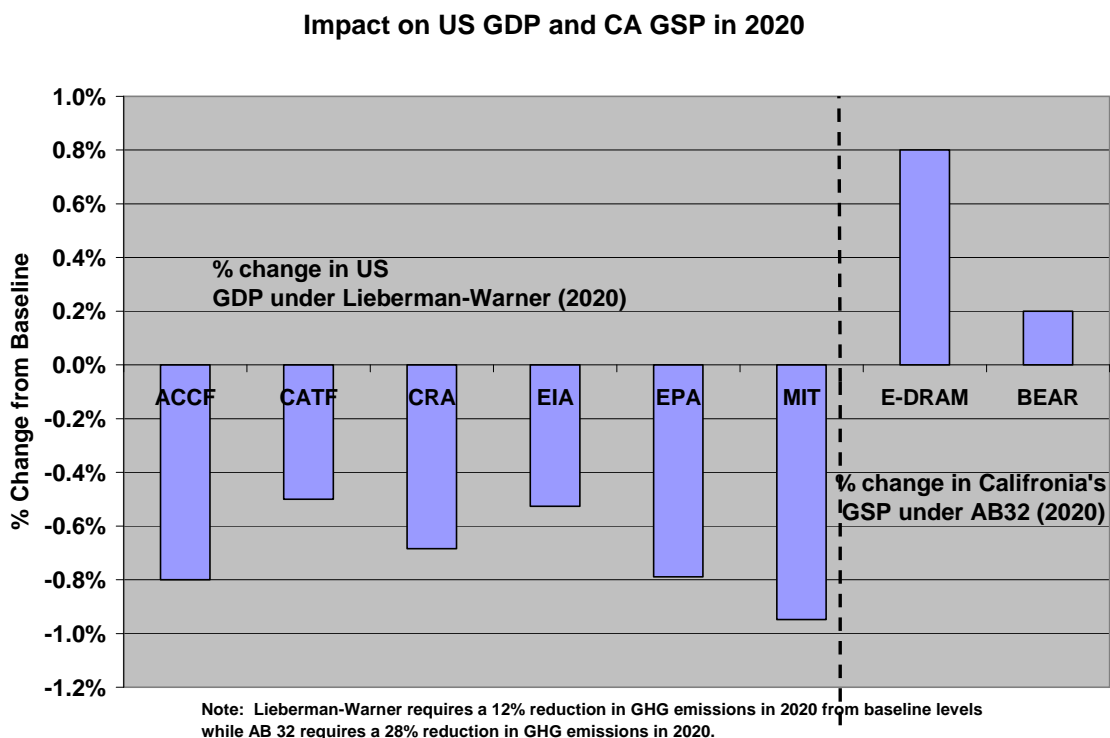
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<sup>1</sup> "Program on Technology Innovation: Economic Analysis of California Climate Initiatives: An Integrated Approach," March, 2007, <http://www.crai.com/Publications/listingdetails.aspx?id=4804&pubtype=Reports>); and "An Updated Macroeconomic Analysis of Recent California Climate Action Team Strategies," October, 2007, [www.epri.com](http://www.epri.com)

mandated under L/W are less than half of those of AB 32. Therefore, one would expect a smaller economic impact for the U.S. under the Lieberman-Warner (L/W) proposed bill as compared to that under California's AB 32.

However, all of the L/W studies found a negative, rather than positive, overall economic impact from imposing a new set of regulations. This is an intuitive result and suggests that the current E-DRAM and BEAR findings are outliers (see Figure 1). Comparing the different national results for L/W reveals that CRA was near the middle of the different studies, especially when only results for similar interpretations of the bill are considered.

**Figure 1 Impact on US GDP and CA GSP in 2020 under Lieberman-Warner and AB 32, respectively**



At a minimum, the differences in modeling results point to the need for ARB to consider other models and modeling approaches before reaching any final conclusions on which policy measures to pursue. It is important to do this so that (1) California residents are fully informed of the uncertainty about the likely costs and benefits of AB32; and (2) so that regulators have the best available information in order to enact the most efficient and least costly set of policy measures to achieve the desired emission reductions.

### **Problems with ARB's Assumptions**

We disagree with some of the underlying modeling assumptions made by ARB. The disagreement centers on a disagreement about the prevalence of market failures and costs to correct these failures. The Climate Action Team (CAT) falls into the category of “technologists,” that “asserts that numerous *market barriers* impede widespread adoption of these technologies. Moreover, they assert that government initiatives to overcome these barriers and thereby improve energy efficiency could reduce emissions and also realize substantial cost savings through resulting reductions in energy expenditures.”<sup>2</sup> CRA and “most economists maintain that, while technology diffusion is typically a gradual process, energy efficiency improvements that truly yield cost savings largely will be adopted without the need for government intervention. Moreover, economists note that many of the barriers that slow or prevent broader adoption of more energy-efficient technologies reflect real economic costs associated with their adoption. Where this is the case, policy intervention that requires or encourages adoption of those technologies would be socially costly. However, some of the barriers inhibiting technology adoption reflect true *market failures* that, if corrected, may both improve energy efficiency and yield economic gains.”<sup>3</sup>

To illustrate our skepticism about the ARB's assumptions regarding the costs and benefits of various regulatory measures in the ARB's studies, we focus on the cost and benefit estimates for AB 1493 (Pavley) and the LCFS. Many economists find fuel economy standards result in costs greater than benefits whereas the CAT finds the opposite. The CAT finds Pavley produces savings of almost 10 times that of costs resulting in a benefit of \$360/tonne of CO<sub>2</sub>. This result leads to a natural question of why regulations are needed to induce consumers to choose these vehicles. In fact, we see vehicle manufacturers responding to the high energy prices by producing electric and hybrid vehicles, and consumers shifting away from large SUV's. Prices for used SUV's have dropped by more than the increase in gasoline costs over the past year. This suggests that market mechanisms do induce changes. Therefore, the magnitude of the market failures that are alluded to in the CAT's cost-benefit analysis of Pavley do not seem to exist.

As for the LCFS, the analysis reports that the costs and benefits are exactly equal. No computations, however, are shown as to how the costs of this program are computed. In fact, the ARB states: “the costs of producing these fuels, given the current cost of gasoline and diesel production, are expected to be highly competitive. Therefore, ARB estimates that there will be no

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<sup>2</sup> Stavins, Robert, Judson Jaffe, and Todd Schatzki, *Too Good to be True? An Examination of Three Economic Assessments of California Climate Change Policy*, RFF DP 07-12, March 2007.

<sup>3</sup> Ibid

net difference in the costs of producing fuels to meet the LCFS versus the cost of producing gasoline and diesel.<sup>4</sup> This assumption seems quite optimistic given the technological breakthroughs required to produce cellulosic ethanol on a commercial scale.

### **Concerns about the (Inappropriate) modeling approach**

We have concerns about the modeling approach used. ARB applied two Computable General Equilibrium (CGE) models (E-DRAM and BEAR) to assess the costs of complying with AB 32. However, these models were not used to characterize consumer and business behavior and their responses to market prices and the rules and constraints embodied in the regulatory measures. Instead, it is our understanding that the models were changed so that they reproduced the results of other studies done by ARB on individual regulatory programs – to incorporate the conclusions of those studies about emission reductions and cost savings.

Thus BEAR and E-DRAM provide no information on the key questions about how the California economy will respond to these measures. This produces, among other things, inconsistencies between the modeling of cap and trade – based on the models own representation of consumer and business behavior and technology – and modeling of the CAT measures – which simply reproduces the results of other studies based on different assumptions and parameters. If, indeed, market failures are so pervasive that the CAT regulatory measures are required, then the assumption that markets work perfectly for the remaining reductions is highly questionable.

Third, these models were not used to seek the least cost economy-wide solution. Several program measures, such as the 33% Renewable Portfolio Standard, are put forward even though their net cost per ton abated exceeds the \$10 permit price under the cap and trade program.

This produces, among other things, inconsistencies between (1) the modeling of cap and trade – based on the models own representation of consumer and business behavior and technology – and (2) modeling of the Climate Action Team (CAT) measures – which simply reproduces the results of other studies based on different assumptions and parameters.

If, indeed, market failures are so pervasive that the Climate Action Team's regulatory measures are required, then the assumption that markets work perfectly for the remaining reductions is highly questionable.

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<sup>4</sup> Climate Change Draft Scoping Plan a framework for change: Appendices June 2008 Discussion Draft Pursuant to AB 32 "The California Global Warming Solutions Act of 2006," Prepared by the California Air Resources Board for the State of California (June 2008).

## **General Concerns about the overall methodology**

Bottom-up analysis fails to account for general equilibrium interactions of all the different programs on the economy. For example, problem of inconsistent energy prices; that is the energy prices against which the costs and benefits were computed may differ from the resulting energy prices in the CGE model after full implementation of the policies.

Analyses can underestimate the costs of emission reduction policies by underestimating: the costs of the actions and investments that are necessary to comply with regulations, hidden or hedonic costs, such as performance risks, changes in vehicle size, performance, and driving characteristics or the impossibility of fitting CFLs into existing fixtures, and/or the costs of policies necessary to bring about those actions and investments, including administrative, monitoring and enforcement costs, perverse incentives leading to costly avoidance behavior, failure to equalize marginal costs across all abatement options, and take back effects.

Market failure is not a magic wand that can be waved over a sector to justify any and all regulatory measures. To minimize unanticipated consequences and adverse effects, remedies need to be tailored to the specific failure – replacement of master meters to reduce an agency problem, mandatory labeling to correct an information problem, altered mortgage qualification rules to correct a bias in treatment of capital and operating expenses for housing, etc. There is no indication that the listed regulatory and efficiency standards represent this kind of institutional change to remedy a market failure, they are simply orders to do something that an analysis done by and for regulators concludes consumers and businesses should be doing.

## **Conclusion / Future Steps**

The bias in the assumptions about the costs and benefits of the measures leads to the result that cap and trade has a limited role in reducing emissions and most reductions should and will come from efficiency standards and similar types of regulations. Our work arrives at exactly the opposite conclusion. In comparing the CAT regulatory policies against a nearly pure market based program, we find the market based programs to be at least 20% less costly.<sup>5</sup>

In summary, we believe that the current underlying set of assumptions and modeling approach lead to the incorrect conclusion of benefits exceeding costs and therefore likely lead to incorrect policy conclusions. Specifically, the results suggest that cap and trade or emissions tax programs have

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<sup>5</sup> *An Updated Macroeconomic Analysis of Recent California Climate Action Team Strategies*, October, 2007, [www.epri.com](http://www.epri.com)

limited roles in reducing emissions and it is more efficient to employ regulatory policies – a conclusion with which we strongly disagree.

We would be happy to work with the ARB, using our state-level model calibrated to the California agency's baseline projections and developed in collaboration with EPRI, to provide an alternative methodology for economic modeling and perspective on the relative cost of different policy approaches.

Thank you again for the opportunity to provide these comments.

Sincerely yours,

(Transmitted via email)

CRA INTERNATIONAL, INC.

Dr. Paul Bernstein	Dr. W. David Montgomery	Dr. Anne E. Smith
Principal	Vice President	Vice President
CRAI	CRAI	CRAI