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September 25, 2009

Professor Larry Goulder, Chairman
Professor James Bushnell, Chairman, Economic Modeling Subcommittee
AB 32 Economic and Allocation Advisory Committee
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Professor Goulder and Professor Bushnell,

We appreciate the attention that the Economic and Allocation Advisory Committee (EAAC) is giving to the important topic of economic impact analysis in support of AB 32 implementation. As representatives of environmental organizations with over 2 million members and online activists combined, we write to offer our views on this topic and suggest that it would be useful for EAAC to provide a dispassionate voice to the often raucous debate around modeling. **We believe it would be helpful for EAAC to issue a statement on economic modeling that communicates the following points:**

- **CARB results are consistent with other studies.** The CARB findings on the economic impacts of the Scoping Plan corroborate many other studies done in the California context and elsewhere. These models show relatively small net macroeconomic effects from greenhouse gas reduction efforts of similar magnitude to AB 32, even before other environmental benefits and avoided climate damages are considered. In addition, future innovation not captured by the models will almost certainly further lower abatement costs.
- **CARB's analysis to date has met reasonable expectations given time constraints, limited resources and the state of modeling science.** It is not reasonable to compare CARB's work to an idealized perfect analysis carried out with unlimited resources and perfect input data. CARB modeling methods compare favorably to other state-level analyses and the approach taken by the US EPA, which has the advantage of much greater resources. Like the US EPA, CARB used two separate Computable General Equilibrium models to assess economic impacts. Moreover, CARB developed extensive sector and technology-specific abatement cost input data for modeling. Of course, there is room for improvement going forward, particularly with respect to uncertainty analysis. CARB's initial failure to perform sensitivity analysis was misguided but CARB took steps to remedy this before passage of the Scoping Plan. CARB should also continue to refine the measure-by-measure assessments of costs and benefits. This is an important form of input data, but there has been little substantive discussion of these inputs (including no specific treatment of these by peer reviewers, except to suggest some measures should be included in the baseline).

- **Peer review criticism of CARB's economic modeling has been misrepresented.** Peer review criticism of CARB's initial economic modeling of the Scoping Plan has been misrepresented as evidence that the Scoping Plan and AB 32 implementation are misguided. Reviewers focused their critiques on analytical methods, and though peer reviewers offered constructive comments, they provided little in the way of insight into the input data that are a crucial driver of the results. Importantly, none of the reviews indicated that CARB's analysis was a reason for the Scoping Plan not to go forward. An EAAC statement that none of the peer reviewers expressed opposition to AB 32 or suggested that AB 32 implementation should be delayed would be useful to counter representations to the contrary.
- **Consideration of co-benefits, required by law, is left out of the economic modeling.** The language of AB 32 clearly directs CARB to give attention to the environmental, public health, and other societal co-benefits, yet the economic modeling does not capture these benefits. Any analytical results pertaining to the costs and benefits of the Scoping Plan should be viewed in this light. CARB should move as expeditiously as possible toward a more granular (i.e., spatially explicit, demographically and economically stratified) and complete analysis of co-benefits. In the AB32 regulatory process and in coordination with the on-going AB32 public health analysis working group, CARB should make economic valuation of public health benefits a priority. If CARB cannot complete such a co-benefits analysis before the end of the year, then it should at least define a process for conducting the analysis going forward. It would be useful for the EAAC to provide guidance on how this can best be achieved.
- **Impacts should be modeled by income level.** CARB should utilize the ability of the EDRAM and BEAR models (assuming BEAR is included in future modeling efforts) to explore economic impacts across income levels. Both models have representative households for each income tax bracket, and by using this feature results can be disaggregated across different household types. Such results would have important policy implications which will be relevant for the recycling and distribution of allowance revenues.
- **Modeling does not reflect the near certainty that innovation will lower costs.** Macroeconomic models almost invariably assume today's technologies. Macroeconomic models, including CARB's, typically ignore innovation or represent it incompletely or inaccurately. This limitation pertains to innovation induced by policy and innovation associated with learning by doing. This has the effect of biasing compliance costs upwards and making climate policy look more expensive than it really will be. Sensitivity analyses or alternative scenarios could be used to describe potential outcomes from innovation efforts.

EAAC's articulation of these points will help clarify expectations about what can and should be done to understand the potential economic impacts of AB32 measures, and will go far to diffuse unconstructive, overblown criticisms of CARB staffs' effort going forward. Please let us know how we can be of assistance to the EAAC's work.

Thank you to all the committee members for devoting your time to the EAAC to help ensure the successful implementation of AB 32.

Many thanks,

Bonnie Holmes-Gen,

American Lung Association in California

Andy Katz,

Breathe California

Shankar Prasad,

Coalition for Clean Air

Chris Busch,

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Jamie Fine,

Environmental Defense Fund

Audrey Chang and Kristin Grenfell,

Natural Resources Defense Council

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