



# South Coast Air Quality Management District

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January 18, 2008

Dr. Alan Lloyd, Chair  
Mr. Bob Epstein, Vice Chair  
Economic And Technology Advancement Advisory Committee  
c/o Steve Church  
Research Division  
California Air Resources Board  
1001 I Street  
Sacramento, CA 95812

Sent via email to: [schurch@arb.ca.gov](mailto:schurch@arb.ca.gov)

Dear Chairman Lloyd:

The South Coast Air Quality Management District staff appreciates this opportunity to provide comments on the comprehensive ETAAC Report Discussion Draft issued on December 21, 2007. First of all, we commend you and the Committee for addressing such a comprehensive subject. There are numerous actions, policies, priorities, incentives and funding opportunities which need to be vigorously pursued in order for the state to fully and effectively address the air quality, climate change and energy issues which confront the state. In general, the draft report lays an important foundation for more focused policy, regulatory, legislative development as well as crucial technology innovation needed to address these challenges.

On balance, District staff strongly endorses the fundamental approach and priorities noted in the report. We also have specific comments related to transportation and station source market segments. We will address these generally in the order in which they appear in the report.

With respect to the overall "Summary Message" we believe that added emphasis should be given to need for technology and clean fuel innovation driven by a combination of regulatory mandates combined with efficient incentives, industry cost-sharing and balanced market support mechanisms. The report in general would be stronger if the complimentary nature of regulatory "performance standards" was acknowledged. While exciting innovations are occurring in the stationary and mobile source arena, more concerted pressure and "discipline", as well sense of urgency, is needed to foster more rapid evolution of market-viable low-carbon strategies which can put us on a path to

achieve the full mandate of SB32. In this regard, we would suggest that the report refer to these imperatives as legal necessities rather than as “critical long term goals.”, as is noted on p. 1-9.

In the summary portion of the document, we recommend that a section be added which summarized the essential core technology and clean fuel innovations which are needed to meet the goals of SB32. Specifically, the following could be highlighted as key areas for state action and policy:

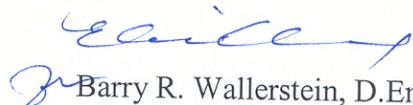
- ✓ Deployment of enhanced energy efficiency and demand side management approaches which emphasize the importance of “constant improvement” at the consumer level, as well as industrial and commercial segments;
- ✓ Deployment of 1,000s of MW of utility, commercial and residential scale solar, wind and other renewable generation technologies, coupled with major renewable energy transmission and distribution investment;
- ✓ Establishment of several “Institutes of Innovation” aimed at expanding the manufacturing base in the state for the following technologies and approaches:
  - Advanced battery manufacturing
  - Advanced PV and wind manufacturing
  - Advanced biofuel collection, production and distribution
  - Advanced urban design principles
  - Advanced marine and port-related options
- ✓ Establishment of several Joint government / industry research centers (perhaps modeled as “campuses”) throughout the state which focus on the development, testing and demonstration of the following core technologies and fuels for the transportation segment:
  - Advanced batteries
    - Lithium ion
    - Other battery chemistries
  - Advanced electric drivetrains
    - Controllers / system architecture
    - Ultracapacitors
    - Regenerative Braking
    - Vehicle to grid interfaces
    - Smart / fast charging
    - Plug-in hybrid optimization
  - Advanced biofuels
    - Cellulosic E85
    - Biodiesel
    - Other cellulosic based biofuels
    - Advanced thermochemical processes
    - Advanced enzymatic conversion
  - Advanced natural gas systems
    - Vehicle optimization / model diversity
    - LNG / H<sub>2</sub> blends, etc.

- Advanced H<sub>2</sub> systems
  - Fuel cells
  - Electrolyzers
  - Bulk and on-board storage media
  - Blended fuel concepts
- ✓ Regulatory mandates which serve as backstop mechanisms to drive private sector investments and reduce the risk of investment;
- ✓ Creation of an independent public agency whose sole purpose is to validate, audit and enforce GHG accounting practices similar to the function which the SEC provides to financial markets.

These six areas could form the core around which to achieve the important initiatives referenced throughout the report. The District staff also have additional comments on specific chapters of the report. We have provided these comments as an Attachment in the order they appear in the report.

We are strongly committed to working cooperatively with all state agencies involved in this issue to fully reconcile and address our air quality needs consistent with a viable and sustainable mix of energy sources and practices. We look forward to further efforts of the ETAAC in this arena. If you have any questions or comments on these comments, please feel free to contact me or Mr. Paul Wuebben, Cleans Fuels Officer, at 909-396-3247.

Sincerely,

  
Barry R. Wallerstein, D.Env.  
Executive Officer

Attachment

## Attachment

### Financial Sector:

A key Financial Sector recommendation calls for the establishment of a Carbon Trust. Before such a Trust is established, however, it should be preceded by a clear understanding of the technology development hurdles, benchmarks, applicable roadmaps, relative strengths, weaknesses, threats and opportunities related to various options. The value chain from research phase to fully mature commercialization is a complex one. It involves significant risk as well as uncertainty. The report does not provide any guidance with respect to these fundamental and underlying criteria. The ETAAC should convene a series of workshops aimed at identifying the key benchmarks for research and commercial success in both the transportation and stationary segments. A rigorous delineation of the barriers and needs related to the core technologies of interest will provide needed credibility, focus and rationale for a Carbon Trust.

### Transportation Sector:

A key Transportation Sector recommendation is “*New Vehicle Technology Improvement*”. This recommendation is noted on page 3-22 of the report. It should be a more prominent focus of the report, given that transportation use of petroleum based fuels represents the single largest GHG emissions segment. It follows the discussion of congestion pricing and employer based trip reductions. These latter two categories, while potentially important, offer far less in comparison to the importance of this issue. New vehicle and fuels innovation should be the focal point of the report, as well as its own section. The report defines “*responsible parties*” as limited to the CARB and the auto companies. However, the role of fuel suppliers should not be excluded, as significant consideration should be given of a fuel-side mandate as well. In effect, the report attempts to atomize the vehicle and the fuel portion of this issue. We believe a more integrated, systematic approach would be more constructive.

There are several “*solutions*” offered in the report related to “*New Vehicle Technology*”, such as the adoption of AB1493 standards which achieve a 50% reduction from pre-AB1493 levels beginning in 2017. Heavy duty as well as light duty vehicles are addressed. The report also acknowledges that “*comprehensive standards*” are called for which are capable of “*driving innovation and the uptake of existing technologies.*” This general observation should be followed by a pragmatic approach to technology RDD&D. This section would be strengthened by noting the importance of technology research, development, demonstration, pre-commercial production and early-phase commercial deployment. All of these steps are essential to achieve sustainable business models which reflect a full understanding of the value chain proposition. A roadmap needs to be identified which can guide this process for various fuel / vehicle combinations. Without such roadmaps, the report tends to lack sufficient specificity. The ETAAC could make a very important contribution if it focused its attention on delineating the barriers and

steps for overcoming these barriers to sustainable commercialization for each of the technologies listed on page 3-24 of the report.

While fuel issues are addressed as part of the Low Carbon Fuel Standard, there is a fundamental need to couple the vehicle and the fuel in an integrated fashion as noted earlier. The separation and isolation of these linked sectors is a major drawback of the ETAAC report. For example, PHEV technology issues are addressed on page 9-51, completely uncoupled from the transportation segment discussion. This creates a disconnected narrative; in contrast, a systems approach is essential to this issue. There is a simple acknowledgment on page 9-52 that “*additional R&D is needed for longer lasting batteries and greater electric-only range*”. However, there is no systematic set of recommendations on how to achieve significant breakthroughs in this technology. In-state investment in battery prototype and high volume manufacturing should be pursued. This should form the core of a major attempt for the state to become the battery development capital of the world. Currently, several Asian countries dominate the intellectual property and manufacturing capability for advanced batteries. An industrial policy should be proposed which address this current major gap in in-state R&D leadership.

Another Transportation Sector recommendations is to shift the demand for mobility and goods movement. These recommendations have been long-standing as the result of numerous public health, congestion and urban design needs. The report suggests several “*possible solutions*”, including the combination of infrastructure funding to Smart Growth goals, as well as adding GHG emission reductions to CEQA guidelines. The SCAQMD staff concur with these general principles.

Another key Transportation Sector recommendation relates to congestion pricing and employer-based commute trip reductions. District staff believe such concepts have merit, provided that adequate attention is given to reconciling other urban travel needs in an equitable and non-regressive fashion.

#### Electricity and Natural Gas Sector

The report appropriately highlights the importance of energy efficiency as an important principle. The District staff recommend that the ETAAC provide more direction for the PUC as well as investor and municipally owned utilities with respect to updated integrated resource planning. There is need for a fundamental re-assessment of the generation, transmission and distribution system if the state is to be configured to achieve AB32 goals in their entirety. The District will be overseeing a regional IRP study, and we would welcome the role of ETAAC and its constituency in this effort. At a minimum, the report should recommend that a formal IRP process be commenced jointly by the CEC and PUC, separate from the IEPR process currently in practice.

The renewable energy segment is a very important aspect of the report. The ETAAC should undertake a detailed roadmap exercise to determine the maximum feasible deployment of renewable resources, along with novel concepts for hybridizing utility

scale renewable facilities with advanced combined cycle natural gas technologies. The report, at a minimum, should identify that California has the capacity for >20,000 MWs of renewable energy in the southern California desert region alone. The report should identify opportunities for constructing a renewable T&D system to make such generation feasible and sustainable.

Carbon capture and storage approaches are identified in the report. Some risk analysis should be performed to better understand the consequences of various CCS failure scenarios. Also, utilization of the "waste stream" CO<sub>2</sub> for fuel production may become feasible if synthesis gas reactions using CO<sub>2</sub> in place of CO can be developed, as proposed by Dr. Olah of USC. While somewhat long term, such approaches may relieve some of the long-term sequestration requirements of such systems.