



November 15, 2007

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SIERRA CLUB  
CALIFORNIA  
California Air Resources Board  
1001 "I" Street  
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**Re: State Alternative Fuels Plan**

Dear Board Members,

Sierra Club California supports the broad conclusions of the Committee Report on the State Alternative Fuels Plan required by AB 1007 (Pavley, Chapter 371, Statutes of 2005). We especially agree that meeting California's greenhouse gas reduction requirements and goals "will require a multi-faceted approach, including increased use of alternative fuels, significant improvements in the energy efficiency of the vehicle fleet, and reducing trips and vehicle miles traveled through changes in travel habits and land management policies."

We also believe that the coordination of multiple state policies helps focus state efforts on alternative fuels, and that extending the report to include a vision for 2050 was wise.

But we have concerns that the report does not put all fuels and technologies on a level playing field. The plan suffers from an over-emphasis on hydrogen fuel cell technology, compared to other more viable technologies. It is important that CARB utilize technological neutrality and equal treatment of the two zero-emission vehicle technologies -- battery electric and hydrogen fuel-cell vehicles.

More specifically:

1) The plan suggests that use of plug-in hybrids and biofuels would be cleaner than scenarios with hydrogen fuel-cell cars, but the plan largely ignores battery electric vehicles. That gap makes no sense, especially at a time when several major automakers have expressed interest in reviving production of battery electric vehicles. At the last minute, the plan also dropped out consideration of important off-road electric technologies such as truck stop electrification, electric standby truck refrigeration units, electric lift trucks and other industrial equipment.

- The report focuses on three possible business cases for alternative fuels, called "storylines," as described on pages 35-37: 1) ethanol and hydrogen fuel cell vehicles (HFCVs); 2) biofuels and plug-in hybrids (PHEVs), and 3) biofuels and HFCVs. Battery electric vehicles (BEVs) are ignored for no good reason. As a result, charts on reductions in GHGs or criteria pollutants don't even include BEVs for comparison.

- Also on p. 37, the report says that if lithium ion batteries and PHEVs are successful, "there will be a natural progression" to PHEV fuel-cell vehicles. We agree with the recognition of the benefits of PHEVs, but suggest that you also consider the potential for a progression to all-electric BEVs.

- The plan assumes throughout that hydrogen will be made by reforming natural gas. Despite the fact that it would be more efficient to use natural gas directly in a compressed natural gas



(CNG) car than to make hydrogen, page 37 dismisses CNG cars by saying only one automaker produces them. This dismissal is unfair, given that no automaker is producing hydrogen vehicles for sale to consumers.

- Charging BEVs directly from renewables is 4 -5 times more efficient than operating fuel cell vehicles on renewably produced hydrogen. This is comparable to the difference in fuel efficiency between a Prius and a Hummer.

2) A detailed study for the Energy Commission by consultants TIAX LLC as part of the AB 1007 process found that BEV electric cars reduce overall (well-to-wheel) greenhouse gas emissions by 68% compared with conventional cars using the existing electric grid; HFCVs would reduce GHGs by 54% (if a hydrogen infrastructure existed), and PHEVs would reduce GHGs by 44%. Buses, too, are cleanest if they are electric, the study adds. Criteria pollutant emissions are similar between EVs and HFCVs and both are much lower than gasoline cars (with the caveat that there are few data on hydrogen reformer emissions):

[<http://www.energy.ca.gov/2007publications/CEC-600-2007-004/CEC-600-2007-004-REV.PDF>]

Note in particular:

- The Findings on page ES-17;

- Figure ES-5 on page ES-9 and Figure ES-6 on page ES-10 for GHG emissions, and

- Figure ES-9 on page ES-13 and Figure ES-10 on page ES-14 for criteria pollutants.

3) The Alternative Fuels Plan uses highly inflated cost estimates to dismiss battery electric vehicles, yet accepts much, much higher costs for the hydrogen scenarios. The report is based on a staff Economic Analysis that states:

- Page 12: The incremental price for battery electric vehicles is assumed to be as high as \$65,000, which is at least 100% too high. The incremental costs for HFCVs are much higher at all time points (up to \$725,000), yet the plan favors them over BEVs.

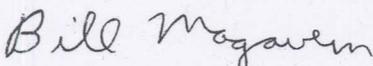
- The cost of RAV4 EVs was \$42,000 ten years ago. Large format lithium ion iron phosphate (LFP) batteries are now less than half the cost and offer twice the energy density of the NiMH batteries in the RAV4 EVs.

- Pages 14-15: Government-funded R&D would be \$67 million higher for hydrogen than for electric drive. Someone would have to build thousands of hydrogen fueling stations costing \$2-\$3 million each, with government picking up 10% of the costs. The electric infrastructure exists and is privately funded. Yet the plan focuses on HFCVs and neglects BEVs.

- The cost-effectiveness of electric drive is better than hydrogen at all time points both in terms of petroleum reduction (page 19) and in terms of GHG reductions (page 20).

For the reasons stated above, we urge the Board to give due consideration to the merits of electric vehicles when formulating policies related to vehicle fuels and technologies.

Sincerely,



Bill Magavern

Senior Representative