

**Subject:** ETAAC Draft Report comments

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Steve:

I have briefly reviewed the draft report of the ETAAC – very encouraging in some ways, and I look forward to some very specific recommendations as the process continues.

To achieve the reductions required to achieve the goals, I suggest, critical innovations are going to be required to be implemented in a large scale. This step in implementing AB32 may be the beginning of major societal change, and we hope so. However the recent track record in California and the USA is spotty at best. For instance, there is a ZEB program with requirements for additional ZE buses in 2009, but no orders for buses (to my knowledge, with the exception of the Burbank bus contract which was recently let by the ARB, and is for a bus which will not be used in meeting the requirements). The recently highly touted FTA FCB program is primarily funding lawyers, to date.

As an example of promising work not even being seriously discussed, there have been several studies that indicate that renewable hydrogen can be provided for fueling vehicles at very attractive prices – in the range of the equivalent of \$4 gasoline.

1. We presented work funded by the SCAQMD (which included a demonstration plant making hydrogen from the wind in North Palm Springs) starting in 2002-2003 showing estimated hydrogen production costs of \$4/kg.
2. The General Electric Global Research labs (Ellen Liu) presented their analysis at a DOE sponsored symposium in September, 2003. Their estimates of wind sourced hydrogen costs ranged from \$3.4-\$8.85/kg delivered to site in New York or Chicago.
3. Most recently (2006) the DOE NREL study by the group of George Sverup shows point of production costs of under \$3/kg.

However – all these studies assume large installations of megawatts of wind turbines, electrolyzers, and delivery to site either by pipeline or LH2 trucks. The investment required is not \$1M, but more like \$1B. This should not be a total surprise ... to produce a system competitive with the petro fuel industry one must spend real money.

This is what it takes to do major innovation, to change from a system importing crude oil – with all its oil spill, ground and air polluting implications – to a system where we approach ZE status .. including near zero greenhouse gas.. and we have “homegrown” fuel.

Were we to start on that road today, and were serious about moving it in the same way we built a war machine in a couple years in the 1941 era.... I suggest that in five years we would have substantially changed our bargaining position and in a decade we could have a world changing transportation system in process.

I am fully supportive of many excellent programs suggested in the Draft Report, such as pay as you go insurance, a California Carbon Trust, congestion charges ... But, if you want the full potential accessible under AB32, and you want the support of the populace, build a new system for providing fuel from local resources. Zero emission fuel.

Batteries are part of it... but we are not convinced the new batteries are up to the demands of battery only vehicles or even the demands of serious range plug-in hybrids. Wait to see Toyota or Honda provide a 7 year warranty for a 60 mile battery ... then I'll be convinced.

Fuel cells, it can be argued, are also not fully demonstrated. But a leading manufacturer is offering a 12,000 hour/5 year warranty to us for our bus fuel cells. This is real progress.

GM and Honda have already shown that they can make very attractive fuel cell cars, They will provide hundreds in the coming year. Ford and BMW have done the same with the HICE concept. ISE supplies fuel cell and hydrogen hybrid buses, and these technologies are on order in low production quantities for customers outside the USA (Canada and Britain).

We can do this in California. Or wait for someone else.

I am providing, as an attachment, some comments that may help support the transportation sections. We offer specifics, and evidence that it is possible to produce clean energy products in this state ... and to build manufacturing jobs supported in large part by selling outside the state!

We could do a much better presentation.... But during the week we design and make buses. If this is of real interest, I offer more detail to you and whoever else may have serious intent.

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