sierra research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

April 22, 2009

Clerk of the Board, Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on LCFS

A number of issues regarding the economic and environmental analysis of the proposed Low Carbon Fuel Standard (LCFS) are discussed in a document entitled "Preliminary Review of the CARB Staff Analysis of the Proposed Low Carbon Fuel Standard (LCFS)" dated April 8, 2009, and submitted to the LCFS record as part of comments submitted by the Western States Petroleum Association. As a result of comments I made at the March 27, 2009 LCFS workshop, I was invited to meet with CARB staff to discuss some of the issues raised in the April 8, 2009 document. During the course of that meeting, I was asked to submit one particular question to CARB staff in writing in order to facilitate a response. That question, staff's response, and my comments regarding that response are contained in the attached email. I request that all of my comments contained in the email be included as part of the rulemaking record and addressed appropriately.

Sincerely,

James M. Lyons
Senior Partner

Attachment

From: Littaua, Renee@ARB [mailto:rlittaua@arb.ca.gov]
Sent: Monday, April 20, 2009 1:58 PM
To: Jim Lyons
Cc: Deal, Ben@ARB; Simeroth, Dean@ARB
Subject: RE: LCFS ULEV/PZEV questions

Hi Jim – just a reminder that if you want comments to be part of the rulemaking record, please submit them through the board making public comments page. (link below).
http://www.arb.ca.gov/lispub/comm/bclist.php
Thanks.
Renee

From: Jim Lyons [mailto:JLyons@sierraresearch.com]
Sent: Monday, April 20, 2009 1:10 PM
To: Deal, Ben@ARB
Cc: Achtelik, Gerhard@ARB; Littaua, Renee@ARB; Lozo, Carolyn@ARB; Werner, Michelle@ARB; Gina Grey
Subject: RE: LCFS ULEV/PZEV questions

Thank you for your response Ben.

Unfortunately, I don't agree with the logic given below for using a ULEV versus ZEV comparison, unless it is the case that you are also making an unstated assumption that the person buying the ZEV is at the same time voluntarily scrapping their current vehicle that they would have otherwise continued to operate.

I think we can agree that when someone purchases a new vehicle, they are going to do the same thing with their replaced vehicle regardless of whether they purchase a new ZEV, a new PZEV, or a new ULEV. For most people, that thing is to sell the vehicle which will then be operated by someone else (not scrapped) and then the person who bought that vehicle will do something else with their existing vehicle and eventually a vehicle may get scrapped. That kind of normal attrition is already accounted for in EMFAC2007 and is reflected in the baseline inventory as is projected growth in vehicle population over time. The scrappage effect, because it is already in the baseline, cannot be counted twice as is suggested by your email, unless, as I note above, you also make the assumption that someone buying a new vehicle will voluntarily scrap their existing vehicle in addition to buying the new ZEV.

If you look back at any CARB staff analysis of the emission benefits of setting new emission standards (LEV, LEV II, ZEV, etc) you'll see that EMFAC was modified to substitute the proposed standards that would apply to new vehicles for the existing standards that currently applied to new vehicles. The emission benefits are only the differences in emissions from vehicles certified to the new and old standards - because what's happening to the old vehicles is going to happen regardless of what the new vehicle standards are.

So, absent the voluntary scrappage assumption, the issue comes down to what's the incremental emissions effect of the new vehicle purchase decision when, as in scenario 4 of the LCFS environmental impact analysis, an assumption has been made that more people will choose to buy ZEVs than is required under the ZEV mandate. The way the environmental impact analysis is done now, the decision is assumed to be a new ZEV purchase instead of a new ULEV purchase. My point was the proper basis of comparison was much more likely given the ZEV regulations to be a new ZEV purchase relative to a new PZEV purchase because of the large volume of PZEVs required to comply under the ZEV mandate with the currently assumed volumes of ZEV and the

large volume of extra ZEVs assumed to be purchased under scenario 4 of the LCFS environmental analysis.

Let's say I'm right, then, the emission reductions of the ZEV purchase are the differences in emissions between the new ZEV and the new PZEV. However, because the manufacturer could also avoid building a number of PZEVs then there would be an emissions increase associated with the ZEV purchase which would be the emissions differences between the new SULEVs or new ULEVs that were produced instead of the new PZEVs. I'd also note that even if the new ZEV was purchased instead of a new ULEV, you'd still have to account for the emissions increases caused by the fact that the ZEV purchase eliminated the need to produce a number of PZEVs.

As for your comment regarding the fleet average NMOG standard limiting emissions increases, your are correct that the NMOG standard needs to be taken into account in the analysis but given that the PZEV sales requirements of the ZEV mandate generally result in NMOG over compliance under the LEV II regulation and emission standards for SULEVs and PZEVs are nearly identical, the existence of the NMOG standard doesn't mean that there will not be emission increases associated with the additional ZEV sales assumed under scenario 4 of the LCFS.

Your point about the potential for changes to other regulations, ZEV, LEV III, and Pavley being able to address increases in emissions resulting from the problems I identify here is plausible. However, if those regulations are adopted, it is also the case that they are eliminating emission increases created by the LCFS. Given that the purposes of the LCFS environmental analysis is to identify the impacts of the LCFS – shouldn't they be included now and then you can say that they'll have to be eliminated later by making changes to other regulations?

Again, I thank you for your response, and hope that you'll consider the above. Obviously, this is a significant issue, because without the emission reductions being claimed for ZEVs in Table VII-13 of the ISOR, the conclusion would be that the LCFS will result in an increase rather than decrease emissions of VOC, CO, NOx, and Sox.

Also it seems at this point, and perhaps you can confirm it, that despite the discussions at the March 27 workshop, there really has been no staff analysis of how the assumptions made regarding the sale of FFVS, PHEVs, BEVs and FCVs under the LCFS impact the emission benefits already claimed for the AB1493, ZEV, and LEV II regulations.

From: Deal, Ben@ARB [mailto:bdeal@arb.ca.gov]
Sent: Monday, April 20, 2009 11:21 AM
To: Jim Lyons
Cc: gachteli@arb.ca.gov; Littaua, Renee; Lozo, Carolyn@ARB; Werner, Michelle@ARB
Subject: LCFS ULEV/PZEV questions

Hello James,

Thank you for your questions they are very well thought out. In response I would like to explain why we used a ULEV emission vehicle for comparison. In the emissions scenarios for LCFS we assumed a single ZEV replaces a single average vehicle on the road today.

Yes, the ZEV emissions benefit will vary depending on the type of vehicle it replaces and assuming it replaces a cleaner emission vehicle than the fleet average vehicle, the emissions benefit will not be overstated. Hence the use of ULEV emissions which represents an even better than average vehicle on the road today and provides emissions benefit that is conservative. The reason PZEVs were not used is because the

goal was to determine what the actual emissions reduction will be on a vehicle by vehicle basis and not what compliance strategy will be used. Although PZEVs sales will increase because OEMs will be using them to meet the ZEV mandate, ZEVs will also be increasing at the same time so both will be replacing fleet average vehicles.

In order for manufacturers to meet the ZEV regulation it is safe to assume they'll use a pathway that is economical for them. This means that if the incremental cost to make 10-35 PZEVs is lower than the production of a complete ZEV they'll continue with the PZEVs. As of right now ARB is currently working on updating the ZEV regulation and some compliance mechanisms may change so an assumption about the types and numbers of vehicles required can be different in the future.

Also, the cap placed on NMOG emissions in California would limit the emissions produced by mobile sources and therefore restrict emissions from increasing. Another area that can have an affect on emissions will be future LEV III regulations as well any modifications to Pavely.

Let me know if you have any questions.

Benjamin Deal
Air Resource Engineer
California Air Resources Board
http://www.arb.ca.gov
916-322-8449

Original message:

Rene:

Thank you again for meeting with me yesterday on the LCFS environmental analysis. The question you asked me to email you about had to do with the assumption in the LCFS environmental analysis that the emission benefits of the sale of an additional ZEV vehicles (above the ZEV mandate requirements) under LCFS Scenario 4 should be computed by assuming that they were sold instead of gasoline powered ULEVs.

My first point was how one could assume that the additional ZEV sales would replace ULEVs given the large volumes of PZEVs currently expected to be sold during the 2010 to 2020 period for ZEV mandate compliance? It seems to me that additional ZEVs will be purchased in lieu of PZEVs which have much lower emissions than ULEVs.

My second point was that one also has to consider the effect of the sale of these additional ZEVs impacts manufacturers' likely responses given the ZEV and LEV regulations. For example, ZEVs sold during the 2010 to 2020 will generate between 2 and 7 ZEV credits, depending on the type of vehicle. Therefore, for each ZEV sale above the "gold" requirement of the ZEV regulation, a manufacturer can avoid having to sell between 10 (2/0.2) and 35 (7/0.2) PZEVs which could be replaced by SULEVs that do not have to meet the 150,000 mile emission control system warranty requirements or zero evaporative emission requirements that apply to PZEVs – and which therefore have higher emissions.

Given this, a better way to look at the impacts of additional ZEV sales seems to me to be to estimate an emissions credit for a ZEV substituting for one PZEV and then accounting for the emissions debits associated with the emission increases due to substitution of 9 to 34 SULEVs for PZEVs allowed by the ZEV credit differentials. Depending on where the manufacturer is with respect to compliance with the LEV regulation's fleet average NMOG standard, it is also possible that some of the vehicles substituted for the PZEVs that are no longer required to satisfy the ZEV mandate could be ULEVs leading to an even greater emission debit. Overall it seems quite likely for the ultimate result of additional ZEV sales to be an emissions increase rather than the emission decrease shown in the LCFS environmental analysis based on the original assumption discussed above.

Let me know if you have any questions.

James M. Lyons
Sierra Research
1801 J Street
Sacramento, CA 95811
916 444-6666