CEC NOVEMBER 14, 2011 WORKSHOP PRESENTATIONS & COMMENTS

Overall, CEC is attempting to show the potential gap in low carbon fuels required to meet the LCFS under two scenarios: a low price/high demand scenario (where low prices stimulate demand and therefore make the required low carbon fuel demand higher) and a high price/low demand scenario where high prices stifle demand and therefore the required demand for low carbon fuel is lower). Clearly, the high price/low demand scenario makes the capability to meet LCFS requirements more achievable, but there are still clear gaps.

There are a number of fundamental assumptions on infrastructure that are made that are optimistic and which may make it appear more reasonable that LCFS goals can be met when in fact they can't be met. An attendee from WSPA (Western States Petroleum Association) commented that to achieve the goals requires a "three legged stool" approach: one leg vehicles/infrastructure, one leg fuels and one leg consumers. It does not appear to me that any of those legs can be in place anytime soon.

I'll cover each presentation below in the order presented, highlighting major issues as I saw them:

Presentation 1: Perspective & Context of Historic Demand and Alternative Fuels

This presentation shows historic trends in California for demands and vehicles, and then shows forecasts for the same (although in some slides they show both history and trends). The historical data is interesting and clearly not disputable. Key takeaways from this presentation are:

1. Light/medium duty diesel , Flex Fuel and Hybrid vehicles have grown steadily through 2009; Propane, CNG and Electric vehicles have had minimal growth (Slide 9)
2. Hybrid vehicles may take 20 years to reach 12% of the fleet in California (Slide 11)
3. New vehicle sales MPG has increased by over 10% from 2006 (21.5 mgp up to almost 24 in 2010); fleet impact is still muted but has reversed the prior trend (Slide 13)
4. Fleet growth from 2010 involves a decline in gasoline vehicles more than offset by growth in hybrids and Plug In hybrids, but by 2030 gasoline vehicles remain by far the largest portion of the fleet, and electric and CNG vehicles are a blip. (Slides 14-16)
5. On slide 21, a very useful comparison of current cost and other assumptions are presented (typical new costs for various types of stations, etc)
6. On slide 24, the average (median) cost to build a station's infrastructure is shown per gallon of throughput. For gasoline, a cost of $470,000 divided by average throughput of 1.225 million gallons is $0.38/gal. The Commission tries to show that there is a range for each fuel assuming the station operates at max turnover..ie for gasoline, the annual throughput would be 18.2 million gallons per year..a ridiculous assumption. The intent of this appears to be to show that with sufficient turnover that average infrastructure costs per gallon could be lowered. (I note also that the Y axis on slide 21 is non-linear…kind of hides the true cost per gallon differences).
7. Slide 26 compares station costs on a cents per gallon basis over a 15 year investment life and assuming median volumes. This presents more representative data. Despite Hydrogen having the very highest cost per gallon, the remaining slides are devoted to Hydrogen fuel, which is clearly not viable. It is not clear why hydrogen merits so much attention.

Overall, recalling the three legged stool, this presentation appears to say that fleet turnover and build-out of vehicles capable of using alternative fuels will be much slower than needed, and that station investments will be very high and require much higher capital recovery costs per gallon than other fuels.

The presentation did not address the infrastructure required to either grow biofuel raw materials, transport to bio-refineries, build bio-refineries, or transport and store the bio-products.

Presentation 2: RFS2 Proportional Share Analysis & Implications

This presentation outlines the RFS2 Federal program and the implications for California. It seems to be positioned to clarify that many of the steps needed in California may need to be taken regardless of the existence of a LCFS (ie some of the costs and import requirements are not due to the LCFS). Highlights are:

1. Slides 2 through 5 lay out assumptions well, and show the current RFS2 timetable very clearly. The Commission is using the 2011 EIA forecast targeted volumes for cellulosic and advanced biofuels, which is clearly more realistic than the legislated annual target volumes. The study also properly assumes than there will be no E-15 blending.
2. Slides 6 through 9 are addressing the US RFS2 looking at high and low demand cases. The low demand case stems from HIGH prices and therefore this tends to stimulate more biofuel supply and therefore a more narrow gap versus RFS2 requirements; a high demand case stems from low prices and this results in less advanced biofuel production and a much bigger gap versus RFS2
3. It should be noted that EPA has already made decisions to reduce the RFS2 requirements based on limited availability of cellulosic supply. This policy makes it very difficult for investors in advanced biofuels to feel that advanced biofuel projects will ever see the value of the tight supply/demand balance (coupled with the lack of any carbon market)
4. Difficult to follow slides 11-18 but it should be noted that the only reference to infrastructure in the higher requirements for ethanol usage is in E-85 infrastructure. No mention of rail infrastructure, port infrastructure, terminal storage and so on. This ignores the very real infrastructure that is needed every bit as much as E-85 stations.
5. Slides 19-25 show that the ability to meet RFS2 requires the use of E-85 in sufficient volumes that the forecast number of flex fuel vehicles in California will be inadequate (especially if not always buying E-85) and that the number of fueling stations will also be woefully short of what is needed.

Presentation 3: Low Carbon Fuel Standard (LCFS) Analysis & Compliance Costs

This presentation looks at the requirements in California to meet the LCFS compliance. The Commission looked at three cases of increasing low carbon fuel availability, and discuss only case 3 in this presentation. This is the case assuming the greatest availability of low carbon fuel.

The analysis assumptions are provided on slides 1-3. The analysis selects the lowest carbon, least cost fuels first. The Commission recognizes the plausibility of assumptions is a key issue. For instance, the analysis assumes that California could have access to half of US cellulosic ethanol and renewable diesel (slide 4). Who knows for sure, but if the price or carbon value is high enough, it may be plausible. However that is not likely to happen if the yardstick is adjusted by EPA every year to reflect cellulosic capacity or if no carbon market is in place.

Slides 8 and 9 show that there is insufficient low carbon material to meet demand in either the high or low demand case (from 2017 to 2024 in the low demand case, and through 2027 in the high demand case) despite the "Case 3" optimistic assumptions. Slide 10 summarizes this and slide 11 raises additional concerns on assumptions.

More significantly, the analysis then makes assumptions on the cost of biofuels based on 2010 and 2011 actual prices relative to (for example) Brazilian ethanol. In slides 12-20 the staff outlines the price assumptions and methodology, however they state the following for a number of the biofuel assumptions:

"Staff used values from 2010 for the low prices (high demand) cases and the values from 2011 for the high prices (low demand) cases"

Staff used 2010 prices for the low price/high demand case and prices from 2011 for the high price/low demand case. Obviously petroleum prices increased from 2010 to 2011, so this was their logic. However, this is an incorrect economic view.

The higher premiums for the biofuels should be used in the low price/high demand situation because that represents where the demand for biofuels is greater and therefore should have the higher premium (See slide 15). The biofuel premium should be driven by biofuel supply and demand, not the absolute price of fuel! This is a fundamental error. The high demand case should be using the higher biofuel premiums, not the low demand case.

A second anomaly involves the assumptions on slide 21. The Commission "builds" up the costs as if the market sets prices based on that and that alone. However, the market price is set by supply and demand, which of course is harder to predict. Nonetheless, slide 21 reasons that the "increase" due to LCFS is only the portion above RFS2 cost (which is an OK assumption), however, if the "gap" in biofuel requirements is due to LCFS, how is that "gap" to be filled and with biofuel from where?

The Commission should recognize that this is a very similar analysis with why California's gasoline prices have historically been disproportionately higher than the rest of the US…unique specs require components to be shipped from remote areas and there is no "local" supply to make up for shortfalls, hence prices spike and shortages occur. In their new LCFS world, that will happen when biofuel supply isn't there, not alkylate (or other gasoline blendstocks whose shortages often created spikes in the past 10-15 years). The economic analysis worries about nuances like carbon intensity content adjustments but ignores any supply shortage premium…despite the fact that those premiums have already afflicted California consumers for years!

You also recall Hawaii's ethanol mandate for 2006, where it was ASSUMED local ethanol plants would be built to meet the mandate, but none were and instead it had to be imported from Brazil. In that case (a very simple but telling correlation to the LCFS matter), the industry simply had to pay the cost for the ethanol and the transportation and never recovered that premium in the market. Fortunately, the ethanol was there. However in California's case they are looking for unique products to meet LCFS and this analysis completely fails to recognize the price aberrations that come with supply shortfalls.

Final comment is that the economic analysis ignores any discussion of the shift in ethanol supply from the Midwest to Brazil. In other words, shifting away from Midwest corn ethanol in California will dramatically impact the economy in the US and either shutdown ethanol plants in the Midwest or lead to ethanol exports. In theory, US ethanol could displace Brazilian ethanol IN BRAZIL! This export/import flip flop is the kind of thing the LCFS can lead to. (This in fact was a comment made by someone from Chevron I believe)

Presentation 4: Low Carbon Fuel Standards: Illustrative Scenarios and Economic Analysis (CARB)

I was not able to be on the call for the CARB presentation, however a review of their presentation indicates the following:

1) They identify how their 2011 scenarios have different assumptions than their 2009 scenarios, and that there are now more scenarios
2) They present several things that are different in some of the scenarios than 2009
3) They show some broad assumptions on gasoline and diesel scenarios for 2011, but never specifically say what the 14 scenarios in fact are.
4) They cite on slide 8 that their economics are assumption driven, not exhaustive, and that they are planning to update their 2009 analysis on petroleum costs, cost-of production and feedstock costs, as well as LCFS credits. This "cost based" analysis does not (and cannot) recognize the implications of a supply/demand shortfall on the price of the biofuels.
5) Slide 9 proposes an alternative approach based on market prices determined by carbon intensity, but warns that this does not take into account fuel production costs or innovation or downward pressure due to market competition. This again ignores UPWARD market pressure due to simple fuel supply and demand which, by all evidence, will be a significant shortfall of required low CI fuels.
6) No economic results of any kind were actually presented, and there were no questions following this presentation.