



October 8, 2009

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

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Comments on: Second Notice of Public Availability of Modified Text and Availability of Additional Documents and Information

Thank you for incorporating some of A 2nd Opinion, Inc.'s (A₂O) earlier comments into the Low Carbon Fuel Standard (LCFS) regulations. However, there are some remaining issues and our intent is that the following comments will result in a better regulation.

§95480.1(c)(2):

This section exempts Liquefied Petroleum Gas (LPG or "propane") from the LCFS regulation. This exemption creates a problem for the renewable propane that is coproduced with renewable diesel. It denies this perfectly good low carbon fuel a role in the LCFS.

To resolve this problem you could keep LPG in the LCFS. But doing so would create a lot of paperwork and record keeping to track a relatively small volume of renewable fuel use in a relatively small market segment. Even if you acknowledge that renewable propane and fossil propane are chemically identical and treat renewable propane like renewable electricity (the renewable producer mixes the renewable product with non-renewable product and then sells the right to the buyer to call his purchase of fungible product renewable) there would be a lot of recordkeeping for no benefit. (The carbon reduction occurs regardless of whether the accounting is difficult or easy.) It would be much more efficient to modify the renewable diesel life cycle analyses (LCA) to allow the net renewable propane energy and carbon to be credited to the renewable diesel production and to leave the propane exemption in **§95480.1(c)(2)** in place.

§95485(a)(1) Table 4. Biomass-based diesel has various per gallon energy contents ranging from about 125 to 132 MJ/gal. How can CARB use one conversion factor, 126.13 MJ/gal, to convert all gallons of biomass-based diesel to MJ? Also, biodiesel tends to be in the low end of the range while renewable diesel is in the high end. If there is a compelling reason to standardize the conversion factor, how about using one factor for biodiesel and another for renewable diesel?

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19 Serenade Pines Place ♦ The Woodlands, Texas 77382-2005

Phone: 281.844.4162 ♦ Fax: 281.966.6914 ♦ Email: A2ndOpinionInc@aol.com



§95486(b)(1)(O) The pathway "Stationary Source Division, Air Resources Board (September 23, 2009, v.12), "Detailed California-Modified GREET Pathway for Co-Processed Renewable Diesel Produced in California from Tallow (U.S. Sourced);" is not ready to become law.

Transportation assumption

The assumption that co-processed renewable diesel is distributed by truck is simply false. Co-processed renewable diesel will not be separated from the ULSD that it is processed with. Therefore its distribution energy and carbon numbers should be identical to ULSD.

Transportation & Distribution		
	Energy, Btu/mmBtu	Emissions, gCO ₂ e/MJ
Renewable Diesel	8662	0.66
ULSD	4721	0.33
Difference	3941	0.33

Admittedly this is not a big error, but methodology should match reality.

Separately processed renewable diesel will also be blended with ULSD prior to distribution because that is the optimum blending location. If the renewable diesel production facility is adjacent to a refinery its distribution energy and emissions will be identical to ULSD. If the renewable diesel facility is not adjacent to a California refinery then there should and will be energy and emissions factors associated with delivering it to the refinery.

Tank to wheels emissions

Another small but needed for reality adjustment involves the tank to wheels emissions. The Biodiesel Renewable Diesel Research Program is confirming the renewable diesel reduces the tank to wheel emissions relative to CARB ULSD. This adjustment only amounts to a little over a tenth of a gCO₂e/MJ. Consistent application of the adjustment will also increase tank to wheels emissions for biodiesel. But, we really must make methodology match reality because the integrity of the LCFS depends on paying attention to the details of reality.

Co-product credits

§95480.1(c)(2) which exempts propane for the LCFS creates a dilemma about what to do with and how to account for the renewable propane that is co-produced with renewable diesel.

Renewable propane is a low carbon fuel that belongs in the LCFS. It takes less energy to produce than it gives back. The fossil carbon emitted during its production is less than the fossil carbon displaced when it is burned or used as a hydrogen plant feedstock. When renewable diesel is made from animal fats or vegetable oils its production is unavoidable. Whether the biomass is co-processed with petroleum diesel or processed in a separate renewable diesel production facility the renewable propane is going to displace fossil propane. We have a choice. We can either simply take net energy and CO₂ credits similar to the bagasse credits taken in the "Detailed California-Modified GREET Pathway for Brazilian Sugarcane Ethanol;" or create complex regulations and accounting procedures to track it. Let's look at some examples of what might be needed.

If the renewable propane is used as renewable diesel process plant fuel the bagasse like credit is obviously the proper path. If it is used as hydrogen plant feed in a hydrogen plant that is dedicated to the renewable diesel plant again the bagasse like credit is obviously the proper path. But, if the low carbon hydrogen produced from the renewable propane is shared with either an adjacent refinery for separate processed renewable diesel or the host refinery for co-processed renewable diesel things



get messy fast. We now need to account for and track low carbon gasoline and diesel fuel that was desulfurized using some of the low carbon hydrogen throughout the distribution system. Similarly if some of the renewable propane ends up in a refinery's fuel gas system we also have to track low carbon gasoline and diesel fuel. If it were recovered and sold as LPG, we must keep LPG in the LCFS and set up tracking methodology and regulations. Rather than go through this it would be better if the renewable diesel pathways used a coproduced energy/CO₂ credit model like used in the sugarcane to ethanol pathway rather than the co-product allocation model used for biodiesel and corn ethanol. This allows us to greatly simplify both the LCFS regulations and the LCA pathway for renewable diesel made from animal fats and/or vegetable oils.

The LCA pathway can be simplified by acknowledging that renewable diesel production processes are really just renewable fuel production processes. Renewable diesel can simply bear all of the energy and fossil carbon inputs to the pathway less relatively small renewable propane energy and CO₂ credits. We do not have to wonder if we should allocate based upon weight, value or energy content. We simply let the desired product carry the load and take credits for the renewable fuel byproducts just like the bagasse energy and CO₂ credits taken in the "Detailed California-Modified GREET Pathway for Brazilian Sugar Cane Ethanol". This methodology is simpler and more robust than the pathways that have non energy co-products and therefore is the appropriate pathway for this product.

The LCFS regulations are greatly simplified because the renewable propane does not have to be accounted for after the credits are taken in the pathway. CARB does not have to concern itself with accounting for low carbon hydrogen produced from renewable propane. CARB does not have to account for low carbon gasoline and diesel fuel produced in refineries that use low carbon hydrogen for desulfurization processes or burn the renewable propane in their fuel systems. CARB can continue to exclude propane from the LCFS.

In the interest of developing simpler regulations and LCA's that more closely model reality CARB should revise all renewable diesel pathways from animal fats and/or vegetable oils before they become law.

§95487(c)(3) and §95487(c)(3)(B) continue to use the term 'biomass-based diesel'. Because renewable diesel is both a diesel fuel as defined in 13 CCR §2281(b) which is exempt from the multimedia requirement under §95487(c)(2)(B) and a biomass-based diesel fuel as defined in §95481(a)(9), the term "biomass-based diesel" in §95487(c)(3) and §95487(c)(3)(B) should be edited to read "biodiesel" and the term "renewable diesel," should be inserted in §95487(c)(2)(B) between "...diesel fuel," and "E100,..."

Do not hesitate to call me if you have questions.

For A 2nd Opinion, Inc on behalf of its client Neste Oil.

Cal Hodge