



December 23, 2008

California Environmental Protection Agency  
Air Resources Board  
Attention: Manisha Singh  
Sent by e-mail to: mansingh@arb.ca.gov

**Re: Comments for Draft LCFS Regulation December 2008**

Thank you for the opportunity to comment on the "**Draft LCFS Regulation**". There are some typographical or technical errors that need to be corrected before the regulation is finalized. Also, I would like to make some comments concerning the GTAP model and indirect land use change.

**Definitions and Acronyms**

Thank you for moving the definitions to the front of the document.

CARB should allow for the inclusion of new renewable fuels other than ethanol, biodiesel esters, and renewable diesel in the LCFS to accommodate both current and future renewable products. For example, a definition for "renewable gasoline" should be included. Renewable gasoline is analogous to renewable diesel – i.e. a hydrocarbon fuel derived from renewable sources, albeit with a smaller carbon chain length distribution. Renewable gasoline is currently being produced as a by-product of renewable diesel production, and could be made "on-purpose" in the future. The same could be said of "renewable propane".

§95420 (a)(1) Renewable diesel fuel is being produced today that can be used without dilution by conventional diesel fuel as either Federal or CARB Ultra Low Sulfur Diesel fuel. Therefore, "Alternative fuels" should also refer to an "R100" which should be defined as an acronym in:

§95420 (b) Acronyms...

(12) "R100" means renewable diesel fuel as produced and before blending

§95420 (a)(1)(A) and (B). Should these ("B100" and "E100") be in §95420 (b) Acronyms...?

§95420 (a)(2)(B) has an apparent typo. It looks like the "Carbon intensity" definition should be numbered "(5)" and the subsequent numbers "(6)" through "(26)" should be increased by 1

§95420 (a)(2)(B)(8) (Which will probably be renumbered to "(9)".) Gives some examples that are technically correct. However, the example: "..., diesel running B5 or B20." Should be replaced with "..., diesel running on biomass-based diesel blends or neat biomass-based diesel components." This would provide wider coverage and you have already used the example: "...blended fuel such as E85 or B20." In this section

§95420 (a)(2)(B)(25) (Which will probably be renumbered to "(26)".) CARB should add "land cleared in a sustainable manner" to the definition of renewable biomass. I know this is different from the Federal definition. But, including a provision for land cleared in a sustainable manner to be used to produce biofuel feedstocks encourages the use of sustainable practices. So the following addition should be made in the definition of Renewable Biomass:

"Renewable Biomass" means each of the following:...

(A) ... , and nonforested or land cleared in a sustainable manner.



- (B) ...by the United States or land cleared in a sustainable manner. ...
- (C) ...
- (D) ...from non-Federal forestlands or land cleared in a sustainable manner. ...

### **Applicability of the Standard**

§95421 (a)(11) Reference to “(B100)” in §95421 (a)(11) should be deleted because §95420 (a)(1)(A) States “ “B100” means biodiesel...” and §95420 (a)(2) states “Biomass-based diesel” means a biodiesel (mono-alkyl ester) or a renewable diesel...”

### **Applicability Standards for Alternative Fuels**

§95423 (c)(1) you need to delete the space in front of “light-duty”

§95423 (e) Table 3...Under Representative Examples for Dedicated or multi-fuel vehicles operating on diesel fuel, ...”, renewable diesel or renewable diesel blends should be inserted after “Vehicles using B5, B20”

### **LCFS Credits and Deficits**

§95425 (a)(2) Table 6. The energy densities of pure biomass-based diesel fuels vary. Therefore, Table 6 should be expanded to include additional biomass-based diesel entries or the methodology needs to allow the use of actual energy densities.

§95425 (a)(3) It is vital that compliance be based upon the total credits generated and A<sub>2</sub>O fully supports the proposal to do so. A<sub>2</sub>O also recommends that light duty diesel vehicles be allowed to generate compliance credits.

If the draft Indirect Land Use Change factors survive the review process most of the currently proven commercial ethanol production capacity will not be effective in meeting the gasoline standard. The proven commercial biomass-based diesel production processes can meet the standard if adequately expanded. Therefore, it is likely that diesel credits will be needed to offset a deficit of gasoline credits.

Given the inherent efficiencies of diesel engines relative to gasoline engines A<sub>2</sub>O just does not see how California can afford to not use light duty dieselization as a strategy to reduce carbon emissions.

§95425 (a)(3), Table 7. 1) Diesel fuel has been excluded from use in Light/Medium duty vehicles – it should be included. 2) California has very few light duty diesel vehicles at this time. Therefore, light duty vehicles fuelled with diesel fuel and biomass-based diesel blends are, for all practical purposes, alternative fuelled vehicles. Because new diesel engines are required to be as clean burning as gasoline engines and are inherently more efficient than gasoline engines encouraging the use of light duty diesel engines can significantly reduce carbon emissions while not harming air quality. Therefore an entry for diesel fuel and biomass-based diesel blends should be added to the Light/Medium duty side of Table 7 with an EER of 1.3 (1/0.78). 3) The phrase “(incl. B5, B20, & other blends)” is neither necessary nor technology neutral therefore should be deleted.

### **Determination of Carbon Intensity Values**

§95426 (a)(4) A<sub>2</sub>O is very pleased to see the option to generate new pathways under Method 2B. In 2005 A<sub>2</sub>O began to tell people about renewable diesel. There has been a great deal of confusion between the terms biodiesel (mono alkyl esters) and renewable diesel. Some of A<sub>2</sub>O’s comments are intended to remove some of that confusion from draft regulation.

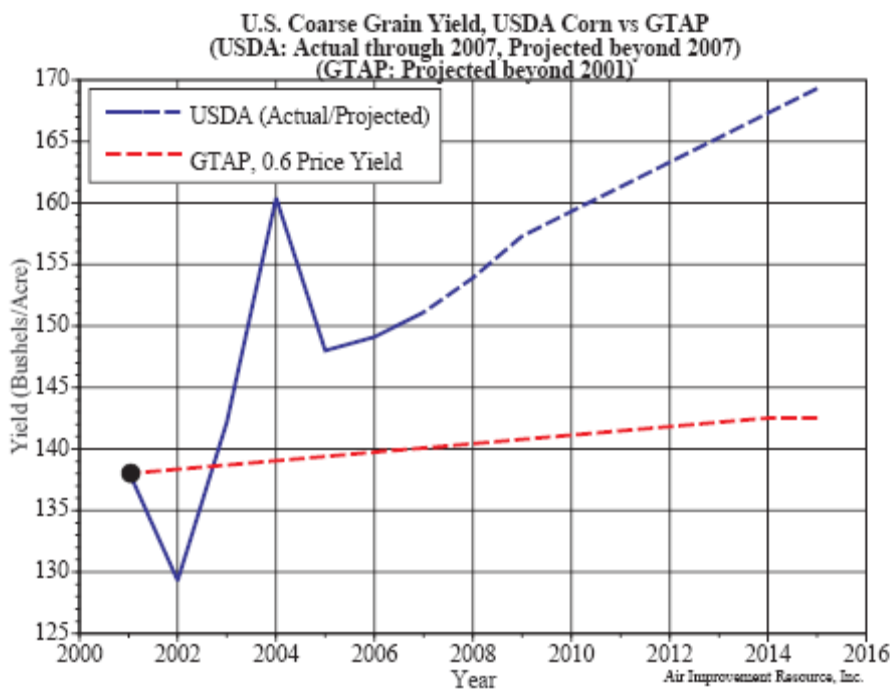
But, the main obstacle to the advancement of renewable diesel in the US has been regulations and laws that were drafted specifically for the older biodiesel technology. There is much research underway that is aimed at producing lower cost, better quality low carbon fuels. Renewable diesel is a product of that research. It is a very good fuel and illustrates why it is essential that the regulations contain the flexibility to allow that research to bear fruit.



§95426 (b)(3)(E) However A<sub>2</sub>O is concerned that Method 2B requires the use of the GTAP Model. In general, indirect land use change models are not at a level that could be used as a regulatory tool. The assumptions are too subjective and uncertain. Also, there is a Social Justice issue that needs to be addressed.

The RFA presentation at the December 2, 2008 workshop provides a good illustration of how the assumptions can change the ILUC factor from 35gCO<sub>2</sub>e/MJ to 4gCO<sub>2</sub>e/MJ. When faced with data and assumptions that appear reasonable but lead to such widely varying answers, perhaps it is wise to do more study before mandating the use of a model that may not be stable yet or at a minimum needs more tuning.

Many years ago I was charged with the responsibility of tuning the linear program (LP) that optimized operations and projected incomes for Standard of Indiana's Texas City refinery. Actual income was consistently falling millions of dollars short of projected. Like GTAP, each piece of the LP was theoretically correct. But, the process units simply were not producing what the LP said they should produce. By comparing actual to theoretical I developed some ad factors that resulted in reducing the yield variance from always being negative by several million dollars to less than plus or minus \$0.1 million. The GTAP model may be having a similar problem to that old LP. For example, while the GTAP ILUC model has a land elasticity factor that captures theoretical yield changes, they do not seem to track actual yield improvements. Slide 7 of the December 2, 2008 RFA presentation indicates that the current GTAP model may need to be tuned to better approximate actual per acre yield improvements.



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Slide 7 from the RFA December 2, 2008 LCFS Workshop presentation

Another way to avoid the tuning problem would be to create some mechanism so that when better land management increases yields so that other land use does not have to change the crops from the better managed land should not have to carry the burden of indirect land use



change. The mechanism could be as simple as being able to earn an ILUC credit to offset the default ILUC debit when using one's own pathway so that directly applicable ILUC values can be reflected. A simple scale that would offset 50% of the ILUC default debit if you increased yield by 50%, offset 100% of the default ILUC debit if you increased yield 100% and perhaps even let you earn ILUC credits if you more than doubled the yield is reasonable. Poor practices could also be penalized.

A<sub>2</sub>O is also concerned that the ILUC concept may deny indigenous people Social Justice. Social Justice is every human's right to improve both the quantity and quality of their life. Before I tie this to ILUC let me tell you why I am concerned. My father abandoned me, my six older brothers, two older sisters and Mama when I was three. As a result we were forced to live on welfare and be industrious. We raised chickens, had a big garden and each of us started working for a living at the ripe old age of 10 or 11. Therefore, Mama did not know how many would be home for a meal so she prepared for all and used the chickens to recycle the leftovers. At one time we had about 150 chickens. Our recycle units provided protein, egg money and fertilizer. As long as Mr. Eames lived across the alley in Kansas City things were good as he loved to hear our roosters' crow and liked really fresh eggs. Unfortunately he passed away and Ms. Whiner moved in. She was a city girl. She did not like the odor of chicken litter and our roosters interrupted her beauty sleep which she sorely needed. She complained to the city and we were subjected to land use change. We had to more than double the land dedicated to chickens by reducing the size of our garden and were allowed only 15 hens and no roosters. Ms. Whiner got environment justice. No rooster woke her and she had less chicken litter to smell. But, we were denied social justice. We had to stay on welfare longer, buy more food and endure a less balanced diet. Mama also suffered her first heart attack during one of our chicken wars. So we lost both quality and quantity of life. The folks in city hall were not in our shoes just like we are not in the shoes (if they have any) of the folks who might want to convert their land to another use in order to improve the quality and quantity of their lives. We just do not have the right to say you cannot change the use of your land because carbon emissions will increase.

The basic premise of ILUC seems to be that whenever food crop land is used to produce a fuel crop rainforest must be converted to food crop land and that that conversion releases carbon. If we underestimate the ability of the direct land user to increase his land's yield or over estimate the carbon release associated with land conversion we do not gain Environmental Justice for the World's population but we do deny Social Justice to the indigenous people who want to use their land to improve the quantity and quality of their lives. In fact because Environmental Justice is achieved when no portion of the population bears a disproportionate share of the environmental burden mistakes in calculating ILUC carbon emissions and perhaps the concept itself may be denying both Environmental and Social Justice to the indigenous people who want to convert their land. Perhaps we should reward those that help indigenous people make their land use changes in a sustainable manner rather than just prohibiting or discouraging land use change.

§95426 (c)(2) A<sub>2</sub>O is concerned that the "10-10" Substantiality requirements may discourage innovation. Innovative improvements frequently come in small increments with small increments in the 1 to 2 % range occurring more frequently than large improvements in the 10% range. The small improvements are worth making in that they represent real reductions in worldwide carbon emissions.

Respectfully Submitted,

*CalHodge*