



April 22, 2009

Mary Nichols, Chair
California Air Resources Board
Headquarters Building
1001 I Street
Sacramento, CA 95812

RE: New Fuels Alliance Comments for Proposed CA Low Carbon Fuel Standard

Dear Chairwoman Nichols,

The New Fuels Alliance (NFA) appreciates the opportunity to provide written comments to the California Air Resources Board (ARB) relative to the proposed California Low Carbon Fuel Standard (LCFS) and the ARB staff's Initial Statement of Reasons (ISOR) issued on March 5, 2009.

NFA is a national, not-for-profit organization that educates political leaders, regulators, public interest groups, businesses, and the general public about the economic, environmental and other benefits of non-petroleum fuel production and use. Its organizational purpose is to bring together the wide range of groups and sectors that are stakeholders in the development of non-petroleum fuels to build a broad and diverse base of support for a more sustainable fuel-energy future in the United States. Some of our coalition partners include Altra Biofuels, BlueFire Ethanol, Cilion, Mascoma, Pacific Ethanol, Qteros, BioEnergy International and Verenium.

NFA recognizes and appreciates the vast challenges associated with implementing, and ultimately enforcing, the world's first carbon-based fuel policy. We strongly support the commitment ARB staff and leadership has toward securing meaningful greenhouse gas reductions in this and other policies.

NFA supports the overall concept of the LCFS. Because the effects of carbon emissions are playing a significant role in the rapid acceleration of climate change, we are opposed to further delay of this important policy. However, several problems exist in the proposed ISOR that would, if adopted as outlined, pose significant challenges to the exportation of the policy to other governmental entities and would also have a negative impact on emerging biofuel technologies that require market certainty and competitive neutrality.

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Stakeholders ranging from advanced biofuel companies and environmental organizations, to scientists and elected officials have voiced significant concerns with the ISOR as drafted. Some of the issues that these and other interested parties have delineated include:

- Treatment of petroleum as it relates to biofuels and the baseline;
- Selective enforcement of indirect, price-induced effects toward certain fuel pathways;
- Use of non-validated modeling for the purposes of carbon regulation;
- Absence of a substantive peer-review process for the LCFS; and
- Incorrect use of baseline fuel characteristics.

NFA believes that ARB can and should impose a stringent carbon fuel regulation that holds all participating fuels equally responsible for their range of impacts. A comprehensive policy that enjoys widespread political support demands that measurable, enforceable and equitable parameters are instituted for all regulated energy options.

Treatment of Petroleum

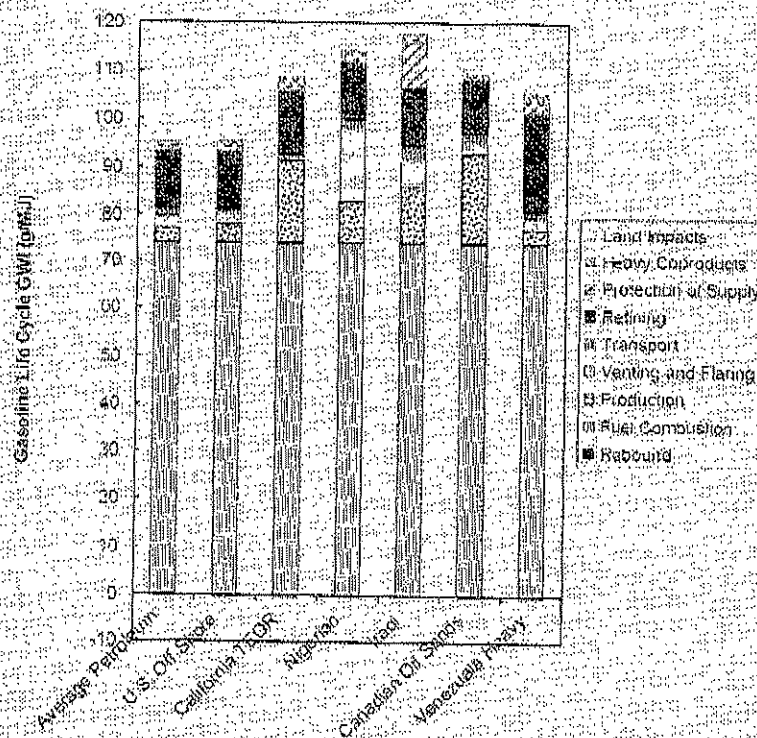
There are several problems with the treatment of petroleum under the draft LCFS rule. We are concerned that the treatment of petroleum will result in increased dependence on increasingly carbon intensive petroleum fuels in the near term.

For reasons unclear to the NFA, the ISOR creates a worldwide marginal carbon score for biofuels (which is inherently higher than a state average score) but only creates a California-based average for petroleum. This approach creates a clear "apples to oranges" comparison in a regulation designed to create a level playing field. Even more starkly, the proposed LCFS uses different years for different fuels; for example, the carbon score for petroleum is currently based on 2010 while the biofuel carbon score is based on 2015. The outcome in the LCFS is a scenario in which CA average 2010 gasoline is compared to world marginal 2015 ethanol. A marginal gallon of petroleum has a much higher carbon intensity than a state average petroleum. This sets up a market competition that is skewed in favor of the 2010 average fuel, which in this case happens to be petroleum. While the ultimate treatment of advanced biofuels such as cellulosic ethanol is not yet determined, it is equally important here that marginal gallons are compared to marginal gallons, or average gallons to average gallons. The alternative, and current proposal, skews the relative carbon values of the fuels.

It is also of significant concern that the ISOR proposes that petroleum is only penalized for getting dirtier if its carbon intensity increases by more than a certain value (~ 15 percent) compared to the *California average*. This means that oil companies can use more carbon intensive crude as the regulation progresses without penalty. From a

policy perspective, it is clear that if a particular fuel's carbon profile increases then it should be held accountable and penalized accordingly. This does not mean that the baseline targets need to be diluted. The LCFS should call for 10 percent reduction from today's baseline, and still require oil companies that get worse over time to hit the same carbon intensity target. Put another way, like biofuel companies, oil companies should be debited for the feedstock they use.

Several months ago, NFA provided ARB with a detailed analysis of the direct and indirect GHG emissions associated with petroleum.¹ Importantly, this analysis was conducted by some of the same researchers who have worked with ARB in the development of the LCFS. The report notes several examples of both direct and indirect impacts of petroleum that ARB has ignored to date. It also states that petroleum can and should be run through economic modeling to test for price-induced indirect effects similar to those accounted for in the biofuel score. NFA encourages ARB to examine this document to ascertain if the proposal adequately captures all of the impacts of petroleum. The report also clearly delineates that petroleum from different regions has different carbon intensity values (see below).



¹ http://www.newfuelsalliance.org/NFA_P1000000_v35.pdf

To illustrate the point, the ISOR contains only three fuel pathways for petroleum, but has identified 12 pathways for ethanol alone.² Clearly petroleum has more than three pathways, yet the ISOR essentially treats petroleum as if it is generic. Again, this creates an opportunity for the baseline "CA average petroleum" score to act as a safe haven for an increasingly carbon intensive petroleum product. It is also worth noting the following passage in the NFA petroleum report:

"The GHG impact of petroleum estimated herein ranges from 90 to 120 g CO₂e/MJ (grams of CO₂ equivalent emissions per megajoule (MJ) of gasoline fuel consumed), depending on the source of the petroleum and to what extent indirect emission impacts are included. The high end reflects unconventional resources and heavy oil, which can contribute to over 10% of current supplies. These emission estimates do not include all of the effects discussed in this report as some effects – most notably the broader economic, price-induced effects of the marginal gallon of petroleum – require further analysis. The range of GHG emissions for average petroleum based transportation fuels used in the U.S. are often reported as having an uncertainty band of +/- 1 to 2 g CO₂e/MJ. When indirect impacts, marginal resources, and uncertainties discussed in this report are taken into account, the range in emissions is considerably greater."

Selective Enforcement of Indirect Effects

The decision to expand any fuel's carbon score from relatively traceable direct carbon effects (i.e. well-to-wheels emissions) to economically mediated indirect carbon effects, as predicted by an economic model like the Global Trade Analysis Project (GTAP), is extremely controversial. The idea that California can predict the domino effects in a world economy with the accuracy necessary to impose a g/MJ carbon penalty on a single gallon of fuel in California is very difficult to comprehend. The idea that world economic outcomes can be predicted based on price alone is also not well supported and will prove even more controversial over time. The additional decision to enforce indirect effects against only one type of fuel is extremely problematic, particularly when the rationale to proceed in this manner has never been articulated. Selective enforcement of indirect carbon effects:

- 1) Is in complete conflict with the vision of the LCFS to remain technology neutral;
- 2) Will skew the relative and real world climate value of biofuels as a compliance fuel, destabilizing the industry and undercutting Governor Schwarzenegger's biofuel plans;

² ARB LCFS ISOR, Table ES-8

- 3) Will make natural gas (which is not penalized for indirect effects) competitive with advanced biofuels (which is penalized for indirect effects), consistent with the petroleum industry's interest in using more fossil fuels for LCFS compliance;
- 4) Will make conventional petroleum (which is not penalized for indirect effects) competitive with conventional biofuels (which is penalized for indirect effects), consistent with the petroleum industry's interest in protecting market share from existing biofuels;
- 5) Will allow oil companies to utilize foreign petroleum resources that are getting more carbon intensive, without penalty up to a limit, under the LCFS instead of domestic biofuels;
- 6) Will almost certainly result in increased petroleum dependence in the near term as oil companies have little incentive to use renewable fuel and domestic conventional biofuel companies are further destabilized;
- 7) Will result in a justified political backlash against the LCFS, jeopardizing its chances of becoming a national and meaningful solution to climate change.

There has been a lot of conversation about how zero is not the right number for the indirect effects of biofuels, but little conversation about ARB's assignment of zero for the indirect effects of petroleum, electricity, natural gas and hydrogen. It is unclear how ARB staff determined that petroleum and other compliance fuels do not have indirect effects associated with their production and use. As discussed, NFA supplied ARB with an analysis of direct and indirect petroleum impacts, but to date we have not received a response.

The ISOR indicates that ARB has examined the indirect effects of petroleum and other compliance fuels, yet the record suggests that this analysis never occurred. None of the reported analysis was ever discussed in a public workshop or other proceeding. Further, the ISOR states that the indirect effects from petroleum and other compliance fuels do not pose significant GHG emissions, and therefore should not be included in the regime. It is unclear what the definition of significant is. The differences in carbon intensities for several fuels are very small. As such, it is imperative that ARB set a level standard that allows for equal accounting of the direct and indirect impacts of all fuels, including the petroleum baseline.

As we have stated several times before, the equivalent indirect carbon effect for other fuels is likely not land use. Indirect land use change is the primary concern for biofuels because it is a potentially land intensive fuel energy source. On several occasions ARB staff and Board members have made public statements that there are no significant indirect land use change impacts for other fuels. The ISOR provides a cursory analysis of the indirect land use change impacts of other fuels, but this is misleading because indirect land use is not the proper indirect effect corollary for other fuels.

The proper question, given how ILUC is derived for biofuels, is what economically derived, price induced carbon effects may exist for other fuels. For biofuels it is the possibility of pushing existing agriculture onto new land. In the case of natural gas, it is the disruptive effect of pulling natural gas out of power markets and pushing new and old power plant projects to coal. For electric cars, it means increasing demand on the grid, which in turn could put more coal plants into electricity markets. ARB has suggested that there will be no expansion effect on power markets because PHEV owners will plug their cars in at night. This is the equivalent of saying that there will be no expansion effect in the agricultural sector from biofuels because new crops will be grown on entirely marginal and idle land. Of course, neither claim is credible. And, as an illustration of potential bias, the GTAP run for grain-based biofuel assumes zero available idle/marginal land.

Use of Highly Uncertain Scientific Modeling

While NFA is primarily concerned about the selective assessment and enforcement of indirect effects against only one type of fuel, we have also noticed that those in the scientific and research community are becoming increasingly alarmed with the application of science in the LCFS, especially regarding ILUC.

ARB is proposing the use of GTAP, a computable general equilibrium (CGE) model, to identify the indirect effects, and specifically the indirect land use change (ILUC) impacts that would be associated with increased agricultural demand from biofuel production. The use of GTAP for this application is troubling for several reasons.

As discussed, GTAP has only recently been peer reviewed for the purpose of carbon regulation. Also, the model has been widely inaccurate in prior uses, as evidenced when it predicted a loss of 10 million acres of U.S. forest from 2001-2006 based on increased biofuel demand. In reality, U.S. forest acreage increased by 0.6 percent over that time period. Further, the U.S. Environmental Protection Agency recently evaluated the strengths and weaknesses of GTAP and ultimately decided not to use the model in that agency's analysis of ILUC for the federal Renewable Fuel Standard. ARB should also recall that the European Parliament recognized that a widely accepted, peer-reviewed predictive model to address the issue of indirect effects does not exist, and determined in December 2008 that ILUC metrics currently contain too many uncertain variables to be used by economists and other regulators.³

Importantly, more than 110 scientists, including members of the National Academies of Sciences, wrote to Governor Schwarzenegger on March 2, 2009 to express their concerns about the direction of the LCFS as related to the selective enforcement of

³ <http://biofuelsandclimate.wordpress.com/2008/12/31/europe-to-study-indirect-land-use>

indirect effects and the science used to make relevant determinations.⁴ The letter contains several criticisms of the modeling proposed by ARB, including the inputs and assumptions used, as well as significant omissions. Further, the scientists argue that the modeling cannot and does not account for a wide range of factors, such as "a shift in policy, weather, world economic conditions or other economic, social or political variables." The scientists note that GTAP fails to consider such basic notions as the use of marginal or idle lands. Moreover, the letter states that GTAP does not use the latest information regarding the high carbon absorption potential for energy crops.

The letter also describes the current state of research on indirect effects, including, but not limited to ILUC:

"We are only in the very early stages of assessing and understanding the indirect, market-mediated effects of different fuels. Indirect effects have never been enforced against any product in the world. California should not be setting a wide-reaching carbon regulation based on one set of assumptions with clear omissions relevant to the real world."

We are aware that more than 100 individuals, and many scientists, wrote a letter in support of the LCFS as proposed. Curiously, this letter emphasizes that all fuels have indirect effects, and indirect effects should be accounted for, but then proceeds to recommend accounting for them in a piecemeal way (against biofuels only at this time). This is the equivalent of recognizing the imperfect nature of the approach but doing it anyway. Going ahead with asymmetrical enforcement of indirect effects might make sense if it coaxed the biofuel industry to improve its carbon performance without derailing the effort. However, the record suggests that far more advanced biofuel companies are opposed to selective enforcement of indirect effects because of the destabilizing effect of even temporarily biasing a regulation. Either way, the existence of both letters only underscores the lack of scientific consensus on this critical issue.

Absence of a Substantive Peer-Review Process

Significant concerns have been raised about the overall peer-review process conducted for the ISOR. In general terms, and despite requests from NFA and others, it does not appear that the ISOR/peer-review process contains any dissenting views from the positions outlined by ARB staff. At the very least, this feeds the perception that ARB was not interested in examining alternative conclusions or methodologies.

NFA members specifically requested ARB staff to analyze and peer-review a February 2009 report by Air Improvement Resources, Inc. (Darlington) that examines

⁴ http://www.arb.ca.gov/lista/lcfs-general-ws/28-phd_lcfs_mar09.pdf

the land use impacts associated with ethanol co-products. While the ISOR does include mention of the Darlington report in the appendix, ARB has not responded to repeated requests for a substantive analysis of the report.

ARB has received comments related to the deficiencies of the LCFS peer-review process from a variety of respected researchers from across the country. For example, Professor Monty Kerley, PhD at the University of Missouri stated in a letter to you that the ISOR indicates it conducted an extensive review of the literature related to wet distiller's grains. In fact, there are at least 88 scientific peer-reviewed articles and the ISOR only reviewed 11 related articles, of which just six were peer-reviewed.⁵ Kerley also notes that the ISOR "does not adequately assess the nutritional value of distillers grain and is erroneous in its conclusion on use potential of this feed ingredient."

Similarly, Hans Stein at the University of Illinois stated in comments to ARB that the ISOR indicates it conducted an extensive review of available literature related to feeding dried DGS to swine. However, upon closer inspection, Stein notes that the ISOR provides only one reference to this matter, which was written in 1993, despite the availability of at least 83 reference articles.⁶ Further, Stein discusses several inaccuracies in the ISOR, including the statement by ARB that phosphorus in DDGS leads to increased excretory of phosphorus in swine. Through research conducted at the University of Illinois, Stein proves that in fact "the inclusion of DDGS in diets fed to swine reduces the excretion of phosphorus because of the greater digestibility of phosphorus in DDGS compared with corn and soybean meal."

In another example, Justin Sexton, PhD at the University of Missouri-Extension notes that the ISOR unveils a potential bias against crediting an ethanol co-product (DDGS):

ARB staff cited one study where replacing steam-flaked corn with DDGS decreased rumen pH and depressed rumen fermentation. A benefit commonly reported in cattle fed DDGS is prevention and/or reduction of sub-acute acidosis (reduced rumen pH) due to replacing corn with DDGS. Selecting a single study where DDGS reduces rumen pH demonstrates ARB staff is either outcome biased or failed to accurately review available data.

⁵ http://www.arb.ca.gov/lispub/comm/becomdisp.php?listname=lcfs09&comment_num=123&virt_num=104

⁶ http://www.arb.ca.gov/lispub/comm/becomdisp.php?listname=lcfs09&comment_num=91&virt_num=77

⁷ <http://www.arb.ca.gov/lis/lcfs09/95-letter-to-ca-apa-air-resources-board-regarding-co-product-credit-analysis-appendix-011.pdf>

All three of these experts issue scathing analyses of the overall issue. Dr. Monty Kerley states "[t]he report reads as fiction supportive of a desired outcome but not as factual information useful for establishment of policy." Dr. Hans Stein of the University of Illinois states, "[t]he Appendix is filled with factual errors that make one question all the conclusions that are reached. The report prepared by staff is poorly completed and the conclusions that are reached are not supported by data from the scientific literature. The work is based on very few references and at least one reference listed is incorrect or falsified." Dr. Justin Sexton states, "The [CARB co-product analysis] ignores current data, presents a biased view, and failed to utilize appropriate scientific justification ... [d]evelopment of public policy using inaccurate and incomplete information will result in detrimental environmental effects in direct contrast to the goals of the CA LCFS."

There is also criticism coming from within the UC system. Glenn Nader of UC Cooperative Extension, University of California, states, "[a]nimal nutrition expertise is greatly lacking in the discussion on pages C-51 to C-54 ... on C-54 the document demonstrates a lack of knowledge on the livestock feeding industry and the educational institutions that work with them ... I disagree with the staff recommendations on DDGs ... I invite the staff to engage the UC-Davis animal science department in the discussion of the correct method to use to evaluate DDGs ration utilization."

There are also important comments made by the peer review team selected by ARB staff. For example, one of the peer reviewers commented, "[t]hat observed data have not be used to validate the GTAP model findings is a significant weakness. The changes in corn production resulting from the federal renewable fuel standard, and the changes in Brazilian sugar production resulting from increased ethanol production should be measurable, and should be measured to validate the model assumptions ... [the ISOR] indicates that the GTAP model results cannot be validated, or have not yet been validated. Surely there is some aspect of the calculation that could be validated."

One of the issues raised is one that the New Fuels Alliance and others have discussed with ARB staff for some time. The historical crop yield increases that have occurred annually over time inexplicably stop in the year 2008 through 2015. One peer reviewer notes, "[t]he lack of a time dimension in GTAP results in an awkward match with the question at hand. Corn yields have been increasing largely linearly for some time now in the United States, yet the model appears to use 2008 corn yields to determine land impacts of corn-derived ethanol. The projected steady increase in use of corn for ethanol in the US over the next few years suggests that land use change will be somewhat less than projected here." Assuming zero yield increases while allowing for increased biofuel production quite obviously will exaggerate the land pressures of increased biofuel production. This needs to be corrected.

NFA includes these examples not in an effort to highlight inevitable inaccuracies in any highly technical assessment, but rather to show ARB leadership that fundamental problems do exist with this critical component of this draft regulation.

Presumption of Baseline Fuel Characteristics

ARB takes an approach to the fuel characteristics of the baseline fuel (petroleum) that creates an immediate complexity for the ethanol industry. Again, in a regulation that was not intended to pick winners and losers, this is a trend that creates confusion in the market for alternative fuel companies and a bias against the fuels they produce.

Specifically, the ISOR shifts the petroleum baseline from E6 (6 percent ethanol) to E10 (10 percent ethanol) in 2010. It is unclear why ARB makes this adjustment, although in side conversations ARB staff have indicated that this assumption benefits biofuels. In reality, this assumption forces ethanol to compete against itself as opposed to the petroleum baseline. This is not productive from the perspective of incenting change in the ethanol industry, and is inconsistent with the clear public policy goals set forth by Governor Schwarzenegger in the original Executive Order establishing the LCFS. To include any compliance fuel in the petroleum baseline, especially future speculative gallons of compliance fuel, sets that compliance fuel at an initial disadvantage because it does not receive credit for the benefits of its use. The proposed LCFS even penalizes oil companies slightly for using corn ethanol, which is a clear incentive to remove existing ethanol from the blend (absent other factors). It is unclear what the intention is, but the addition of more ethanol in the baseline suggests that the state policy goal is to replace what it perceives to be bad ethanol with what it perceives to be good ethanol. This may be the outcome of a properly balanced LCFS, but should not be achieved by arbitrarily altering baselines and blending compliance fuels with baseline fuels.

Conclusions and Recommendations

The New Fuels Alliance strongly supports the concept of the LCFS. Its coalition of conventional and advanced biofuel companies looks forward to the enforcement of an LCFS that establishes a truly level playing field. Unfortunately, we share the concerns of more than 100 scientists, several environmental groups and many CA advanced biofuel investors that selective enforcement of indirect effects will bias an otherwise productive regulation and create ripple effects in the advanced biofuels sector.

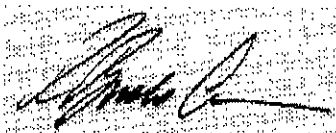
If ARB adopts the LCFS as envisioned by the ISOR, it will send a very clear signal to the market and to other governmental bodies that California does not believe that petroleum and other compliance fuels have indirect impacts, and that conventional biofuels are not a part of California's energy future. Destabilizing the conventional biofuels industry with asymmetrical carbon penalties and undercutting critical

renewable fuel infrastructure investments in California will be no more effective at promoting second-generation technology than would be the effort to promote advanced solar and wind by destabilizing the first generation wind or solar industry. And in the near term, with biofuels at a disadvantage, California will burn more oil.

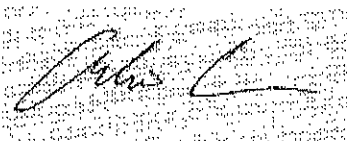
Fortunately, there is a simple solution to a complicated problem. NFA respectfully recommends that ARB adopt an LCFS regulation based on direct carbon effects (including direct land use) and lead a rigorous, international 18-24 month analysis of the market-mediated effects of all fuels. The agency should utilize the expertise of a third party, such as the National Academy of Sciences, to augment its technical analysis of the indirect effects of all fuel pathways. During this period, California should refocus its current energies on creating a much more dynamic treatment of direct land use in the LCFS because a wide set of incentives to use land more efficiently will prevent indirect land use change more effectively than a de-facto ILUC penalty on all biofuels that use land. This outcome will send the right signal to the marketplace, including advantaging advanced biofuels based on sound science, without destabilizing the entire biofuels sector, jeopardizing the effectiveness of the LCFS and embedding status quo petroleum dependence.

We appreciate the opportunity to comment and would be pleased to answer any questions you may have about this important policy.

Sincerely,



R. Brooke Coleman
Executive Director
New Fuels Alliance



Andrew Schuyler
Regional Director
New Fuels Alliance