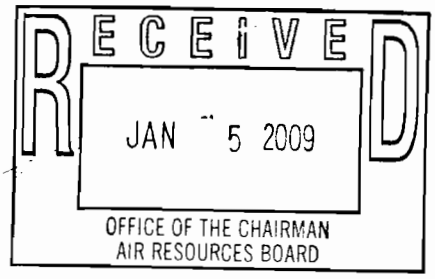

December 22, 2008

Ms. Mary Nichols
Chairperson
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

ORIGINAL - Board Clerk
Copies - Executive Officer
Chair

RE: California Low Carbon Fuel Standard

Dear Chairman Nichols:

The Iowa Farm Bureau Federation (IFBF), Iowa's largest general farm organization with more than 154,000 members, appreciates the opportunity to provide comments to the California Air Resources Board (CARB) on the prospect of including indirect land use change (ILUC) in the California Low Carbon Fuel Standard (LCFS), and more specifically, to discuss the context and scope of ILUC issue. In addition, we address the public policy challenges and implications of attempting to enforce indirect effects of any kind in the regulation.

IFBF policy supports achieving the goals of national energy security, enhancing economic stability, competitiveness and independence. To this end, we support the development of comprehensive state and national energy policy. This policy is based on these principles: support for research and development to foster the discovery of new technology, development of infrastructure and capital investment while utilizing renewable energy sources, and practicing conservation.

We believe that market-based solutions such as a low carbon fuel standard, rather than federal or state emission limits, should be used to achieve a reduction in carbon dioxide emissions from mobile sources. We also believe that the carbon life cycle analysis of bio-fuels should not include carbon impacts resulting from indirect land use changes in other countries.

This policy is the basis for our consideration of ILUC in the context of a California LCFS. We have examined the state's Assembly Bill 32 (Chapter 488, Statutes of 2006), which was signed into law by Governor Schwarzenegger on September 27, 2006, and a subsequent Executive Order (S-01-07) dated January 18, 2007. The California legislation clearly directs the CARB to "...design emissions reduction measures to meet the *statewide* emission limits for greenhouse gases established pursuant to this division in a manner that

minimizes costs and maximizes benefits for *California's* economy, improves and modernizes *California's* energy infrastructure and maintains electric system reliability, maximizes additional environmental and economic co-benefits for *California*, and complements the state's efforts to improve air quality." The legislation also directs the CARB to "...*consider* all relevant information pertaining to greenhouse gas emissions reduction programs in other states, localities, and nations, including the northeastern states of the United States, Canada, and the European Union." It also directs the CARB to *consider* the potential for direct, indirect and cumulative emission impacts from market-based compliance mechanisms.

The legislation also directs the CARB to ensure that its rules *do not interfere with federal efforts* to achieve and maintain ambient air quality standards. Nowhere in the California legislation or the executive order is there explicit language that directs *how* a LCFS should be implemented with respect to ILUCs that the CARB might consider.

Federal Legislation

At the federal level, the Energy Independence and Security Act (EISA) of 2007 amends Section 977 of the Energy Policy Act of 2005 (42 U.S.C. 16317). This section of the 2005 Act promotes the establishment of a research program focusing on microbial and plant systems biology, protein science, and computational biology to support DOE energy, national security and environmental missions. The federal EISA more clearly defines "lifecycle greenhouse gas emissions" to include direct and significant indirect emissions "...as determined by the Administrator...." The EISA also amends Section 307(d) of the Biomass Research and Development Act of 2000 (7 U.S.C. 8606(d)) in its tools and evaluations section, which directs "...the improvement and development of analytical tools to facilitate the analysis of life-cycle energy and greenhouse gas emissions, including emissions related to direct and indirect land use changes, attributable to all potential biofuel feedstocks and production processes...." The federal ESIA also more broadly considers life cycle costs, impacts and analysis of a variety of systems and programs, but predominantly those associated with new building codes and construction projects.

The federal legislation clearly can also be summarized as not explicitly directing *how* ILUCs should be consider with respect to implementation of a LCFS.

Focus on Market Solutions

With this legislative background in mind, it seems clear to the IFBF that the CARB needs to focus on market-based or regulatory implementation actions for which it has statutory authority. Implementation actions that interfere with other states' efforts to control greenhouse gases, in the absence of any underlying statutorily-approved regional agreements and mechanisms or federal authority, may be risking legal challenge.

It is also important, therefore, that any California LCFS that may result from this rule-making effort be careful in its potential regulatory approach so as not to conflict with other state, regional and federal policies, laws and regulations designed to foster sustainable fuel

production. Inaccurate or incomplete ILUC analysis and modeling in development of a LCFS can easily be the result. Direct quantification of ILUC by its very nature impossible, and indirect impact modeling is too uncertain to use as the basis for regulation.

Testimony already provided to the CARB in January 2008[1] speaks to the great uncertainty in the numbers contained in life cycle analysis (LCA) and ILUC. LCA has significant value if used properly, but it is a limited tool and exists to make comparisons and should not be done in the ideal or the abstract[2]. The regional, federal and global policy implication that may result from a state unilaterally using incorrect assumptions is potentially arbitrary and capricious. Thus, the potential decision by California to extend the scope of a state LCFS from direct to indirect, market-mediated effects is bad public policy.

Indirect Land Use Impacts Uncertain

Direct impacts are relatively certain, verifiable and attributable to specific types of fuels, This is true because these effects are directly related to and traceable to the production, transportation and combustion of those fuels, including upstream land use change attributable to fuel production, such as the conversion of pasture to corn or other biofuel feedstock. Indirect impacts, on the other hand, occur as a result of a combination of drivers that may be market-related, policy-related, or as a result of a myriad of societal variables that have no connection to biofuels policy. They are, in essence, the ripple effects of all existing public policies, both domestic and foreign and the myriad of decisions in the global economy.

It is arrogant and capricious to assume that cropping decisions in the U.S. which may occur in response to domestic biofuels demand are the driving forces that bear responsibility for cropping and land use decisions that have negative environmental impacts in foreign lands. Sovereign nations control land use decisions within their borders. While it may be appropriate to hold U.S. biofuels accountable for land use changes within the U.S. - if an accurate appraisal of such changes could be determined - it is totally inappropriate for a state, regional or federal LCFS to ascribe land use changes in other sovereign nations to U.S. biofuels.

Indirect impacts have not been enforced by any regulatory agency against any product in the world. Indirect impacts, whether applied to biofuels or any other fuel, occur as a consequence of a myriad of nested policy and socio-economic variables. An article published in *BioScience* magazine captures the complexity of indirect effects, as they relate to deforestation: "[A]t the underlying level, tropical deforestation is ... best explained by multiple factors and drivers acting synergistically rather than by single-factor causation,

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[1] Michael O'Hare, *Greenhouse Gas Emissions From Indirect Land Use Change*, CARB LCFS Working Group 3 January, 2008.

[2] Bruce E. Dale, *Life Cycle Analysis Of Biofuels & Land Use Change: A Path Forward?*, Environmental Defense Fund Workshop, Berkeley, California, July, 2008

with more than one-third of the cases being driven by the full interplay of economic, institutional, technological, cultural and demographic variables."[3]

While it may be possible to model these impacts over time, the fact is that there is no model today that comes close to capturing the interplay of economic, institutional, technological, cultural and demographic variables inherent with quantifying the indirect impact of any fuel. In fact, the economic equilibrium models being offered as the mechanisms to enforce ILUC in the LCFS were not designed for regulatory use – i.e., to assign specific compliance metrics to specific fuels. They were designed to analyze the impacts of policies in more general terms and the discovered impacts are a result of model design and the limited choice of variables used within the model.

Using a model to publish a paper or consider possible policy alternatives is very different than using a model to assign specific values for a regulatory program that could fundamentally change the business landscape for alternative energy companies. As indicated in a 2008 Global Trade Analysis Project (GTAP) paper on biofuels, referenced by the CARB LCFS website under GTAP peer review: "Researchers have begun to use a CGE (computable general equilibrium) framework [to assess biofuels], however, with several caveats such as lack of incorporating policy issues, absence of linkages to other energy markets, and land use changes, etc. Our study makes an attempt to address these issues. However, the studies on CGE modeling are few, largely due to the *infancy of the industry and limitations on the availability of data* [emphasis added]."[4]

RFA Study & FRS Impact

In fact, one very recent analysis found that the expanding U.S. ethanol industry will only have minor impacts on land use changes both in the U.S. and abroad. According to a new report by the Renewable Fuels Association, the amount of land required to grow and produce 15 billion gallons of corn-based ethanol -- required by 2015 under the Renewable Fuels Standard (RFS) -- amounts to less than 1% of world cropland. According to the report, "Understanding Land Use Change and U.S. Ethanol Expansion," it's because "...gains in agricultural productivity, coupled with the contribution of feed produced as an ethanol co-product, are expected to significantly mitigate the need for conversion of non-agricultural lands to support expanded U.S. biofuels production."

The study, which used projections from Informa Economics, found that in 2007-08, only 0.9% of the world's major cropland was needed (on a gross basis) to meet the grain requirements of the U.S. ethanol industry. "When the ethanol industry's production of feed co-products are factored in, the net use of global cropland for U.S. ethanol production was 0.6%, or an area roughly the size of the state of West Virginia," the study noted.

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[3] Helmut J. Geist & Eric F. Lambin, *Proximate Causes and Underlying Driving Forces of Tropical Deforestation*, BioScience Magazine, Volume 52, No. 2 (Feb. 2002).
[4] See https://www.gtap.agecon.purdue.edu/resources/download/4034.pdf, p. 3.

Using unsupported assumptions, imprecise economic models and questionable logic, some have suggested growth in U.S. biofuels like ethanol would indirectly cause significant conversion of forest and grassland to agriculture in the U.S. and abroad," the report said. "Moreover, there is no empirical evidence demonstrating land conversion abroad is a result of U.S. biofuels production," the study found.

Unfortunately, the current state of land use change science is far from conclusive and no consensus exists on how best to analyze the potential indirect land use impacts of expanding biofuels production," the report added.

We are aware that proponents of including ILUC in the regulation argue that a preliminary quantification of ILUC is better than ignoring the impact all together; that "zero" is not the right number for ILUC for biofuels. While it may be true that zero is not the right number for the indirect effects of any product in the real world, enforcing indirect effects in a piecemeal way could have very serious consequences for any LCFS.

LCFS for All Fuels

For example, zero is also not the right number for the indirect impact of producing a gallon of petroleum, using more electricity from coal and natural gas, producing advanced batteries and hybrid vehicles, or commercializing fuel cell technology. Yet, to date, CARB has not devoted any significant LCFS rulemaking resources to investigating the indirect effects of other fuels. If CARB is to enforce indirect, market-mediated effects, it must be enforced against all fuel pathways. The argument that zero is not the right number does not justify enforcing a different wrong number, or penalizing one fuel for one category of indirect effects while giving another fuel pathway a free pass.

Proponents of ILUC inclusion insist that they know enough about ILUC to enforce it in a fuel regulation. For example, the June 26 UC letter defending ILUC inclusion states that ILUC is more certain than claimed because the analysis conducted to date utilizes peer-reviewed models like FAPRI and GTAP. However, the fact that these models are peer-reviewed should not be inferred to mean that they have been peer-reviewed to be used for the purpose of enforcing indirect effects against specific fuels in a carbon-based fuel regulation. The June 26 UC letter also does not acknowledge the depth of uncertainty of predicting market-mediated effects of any kind, or the status of current research into this vast scientific space. For example:

- The current ILUC analysis for biofuels is very limited in scope. The public discussion has thus far been limited to the reductive effect of corn ethanol demand on world agricultural markets, and the possible conversion of relatively pristine lands that could occur from agricultural expansion. In addition, CARB has commented that non-corn energy crops (e.g., for cellulosic ethanol) will have a similar land use ripple effect if, in fact, land is used. But the analysis has not investigated the possible counter-balancing effect (i.e., benefits) of increased biofuel production, whether related to more sustainable agricultural land use and crop shifting, decreased urbanization, or the market-mediated effects of additional

fuel supplies. Given that land use change comes as a result of the interplay of so many variables, the exclusive focus on the reductive land use effect is of great concern.

- The modeling scenarios publicized to date have severe data and technical shortcomings. While it is true that the GTAP model is peer-reviewed, it is also well recognized that any model is only as good as the inputs used. For example, the UC letter states that they are using the "state-of-the-art" GTAP model to perform ILUC analysis for corn ethanol. The GTAP results were largely similar to those released by another researcher using the FAPRI model. But the UC letter fails to mention that they used the same land use conversion emissions data – a single set of data from the 1990s – for both exercises, without any apparent additional analysis or verification. So it should not be surprising that the results are largely the same. Other land use emissions studies have shown a ten-fold difference in land conversion emissions depending on what assumptions are used.

- In another example, the GTAP model does not include inputs for idle or Conservation Reserve Program (CRP) lands. This is a concern for two obvious reasons: (1) idle domestic lands will be the first to be converted under any reasonable land conversion scenario; and, (2) any model that does not include idle and CRP land will produce exaggerated forest effects because the major points of domestic agricultural land use expansion are disabled. The preliminary ILUC numbers reviewed to date have been described as robust by several researchers involved, but an analysis that does not include the major points of domestic agricultural land expansion is not robust. It is important to note that the amount of U.S. agricultural land acreage dedicated to all crops, and coarse grains in particular, has generally declined during the last several decades while agricultural output has increased.

- None of the available models being utilized for ILUC analysis are capable of taking into account the "interplay of economic, institutional, technological, cultural and demographic variables" inherent with land use change. For example, the GTAP figures presented by CARB staff on June 30 were neither sensitive to U.S. federal biofuels policy, which contains land use provisions designed to discourage irresponsible land conversion, nor the energy or land use policies in those countries where the land conversion allegedly takes place in the scenarios modeled. This means that the ILUC scenarios do not (and cannot) take into account variables that would fundamentally change the outcome of the given modeling exercise, even directionally. Among the many variables driving deforestation and other forms of land use change are domestic and international policy, infrastructure development (including roads for oil and timber extraction), soil quality, topography, droughts, floods, wars, domestic cost of labor/land/fuel or timber, population and migration. A recent paper published by the National Academy of Sciences (NAS) notes that, "... no facet of land change research has been more contested than that of cause. Empirical linkages between proposed causal variables and land change have been documented, but these commonly involve the more proximate factors to the land-

outcome end of complex explanatory connections, such as immigrant, subsistence farmers and deforestation or locally configured common property resource regimes and land degradation. The distal factors that shape the proximate ones, such as urban poverty or national policies, tend to be difficult to connect empirically to land outcomes, typically owing to the number and complexity of the linkages involved. Attention to proximate causes elevates the potential to commit errors of omission."[5] In trying to ascribe specific, numerical land use impacts to specific types of biofuels, CARB and UC staff are in essence attempting to disentangle nested variables when it is the cumulative effect of these factors that cause the net outcome of land use change. This may be useful for policy analysis, but is far more dangerous as a methodology for assigning specific indirect land use change values to specific fuels within in a small fraction (CA ethanol) of one sector (transportation fuels) of the global economy.

- The noticeable lack of indirect effects analysis for other fuels, particularly oil, is of serious concern. CARB staff has mentioned the possibility of an ILUC analysis for petroleum, but land use is only a part of the overall indirect carbon effect of oil. The indirect effects of unmitigated petroleum consumption, in a world economy largely dictated by petroleum and energy indicators, are vast. For example, noted agricultural economist (and architect of the GTAP model) Wally Tyner recently concluded that 75% of the run-up in *corn prices* is due to increased oil prices. Advocates for ILUC inclusion argue that higher corn prices cause crop shifting toward corn and away from soybeans, which drives up the price of soybeans and attracts Brazilian (rainforest) acres to soybean production. However, the UC researchers appear more inclined to ascribe the carbon effects of this theoretical causal chain to biofuels rather than to oil. It remains unclear, in a space characterized by many layers of interrelated effects, whether ascribing this effect solely to biofuels is correct. If the rising price of agricultural commodities is a concern – as the catalyst for additional planting – it is now clear that oil prices have a profound effect on agricultural commodity markets. There are also market- and policy-mediated effects for electrification from coal and natural gas, hydrogen production from coal and natural gas, and hybrid production.

- The reality is that in 2008 there was a significant increase in corn and other commodity prices. At the peak of the price spike, many pundits ascribed these price increases to the use of corn for expanded ethanol production, but they are at a loss to explain why corn and other commodity prices have fallen below year ago levels while ethanol production has continued to expand. Could it be that the prices spike had much more to do with a precipitous decline in the value of the dollar, adverse weather events and a general speculative fervor that resulted in a temporary increase in all commodity prices rather than causality linked to ethanol and biofuels?

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[5] B.L. Turner II, Eric F. Lambin, Anette Reenberg, *The emergence of land change science for global environmental change and sustainability*, PNAS vol. 104, no. 52 (Dec. 26, 2007).

- The June 26 UC letter argues that underestimating ILUC for biofuels is probably worse than overestimating ILUC since underestimating ILUC would create incentives for the overproduction of crop-based biofuels. The obvious implication of that position is that without ILUC penalties for biofuels, we may face a runaway, unfairly advantaged crop-based biofuels industry with potentially serious land use impacts. This position seems out of touch with the realities of the U.S. transportation fuels industry. Roughly 86% of the federal subsidies handed out to energy companies between 2005 and 2009 will go to fossil fuel companies. A recent report out of Purdue University (by an author of the GTAP model) concluded that the price of oil is primarily responsible for the increased price of grains, including corn. The increasing price of energy prices in general as well as agricultural commodities has put enormous strain on the conventional biofuels industry, suspending production at dozens of plants. The initial LCFS policy analysis published in August 2007 recognized that the new, low-carbon transportation fuels needed in California are at a disadvantage because they "...compete on a very uneven playing field: the size, organization and regulation of these industries are radically different." It is difficult to see how enforcing even conservative indirect effects against biofuels, especially while not enforcing any indirect impacts against other fuels (as is the current LCFS trajectory), would unfairly incen crop-based biofuels. More likely, it will perpetuate the status quo, and continue California on a path toward (increasingly less sustainable) oil dependence. It is also instructive to point out, as the LCFS policy analysis did in August 2007, the duality of California's climate policy: to encourage investment and improvement in current and near-term technologies, while also stimulating innovation and the development of new technologies. To this end, it is imperative that the LCFS value and devalue all fuels equitably, so as not to exacerbate an already uneven playing field for alternative fuels.

- The fundamental assumption of the current ILUC argument – that using an acre of land in the U.S. for fuel will require almost an acre of crop development somewhere else – produces questionable results when applied to good public policy initiatives. or example, under the same assumption it is possible that setting aside land for the CRP creates more carbon emissions, because it takes agricultural acreage out of domestic food and feed production, which results in grassland and rainforest cultivation abroad. It is possible that other land protection policies, including national parks and wilderness areas, also fail the "zero sum" land use assumption because they take timber and agricultural land out of traditional production.

- Enforcing indirect impacts using the methodology envisioned by CARB may produce questionable market behaviors. CARB has discussed having a "non zero" land use change attribution (i.e., a penalty) in the LCFS for certain broad categories of fuels (e.g., corn ethanol, biodiesel, cellulosic ethanol, etc.). However, it is generally accepted that different regions have different tolerances for increased agricultural production, as well as different indicators for agricultural products based on weather, supply and demand, annual plantings, etc. Yet, agricultural

expansion in a region that can tolerate it pays the same ILUC price under the LCFS as expansion in regions that cannot tolerate intensification. Farmers of both regions, irrespective of the efficiency or sustainability of their crop, pay for theoretical environmental damages abroad that they have no control over. The public policy proposal to penalize products for decisions and trends far outside of their sector and control is a major one, may not produce the desired behavioral effect, and should be rejected.

- We are also not sure that CARB is applying the principle of indirect effects enforcement in a balanced and consistent way. For example, CARB staff has made clear their inclination to debit all crop-based ethanol for ILUC, irrespective of the type or location of the land used for production. However, on the subject of tar sand petroleum use by oil companies, CARB staff has implied only that oil companies will be debited *if they use tar sands in California.* Put another way, the penalty for biofuels is automatic while the penalty for oil can be avoided by redistributing its product. This creates obvious compliance inequities, but also questionable climate accounting in the marketplace. Oil companies will simply use lighter crude in California to escape penalty under the LCFS. But this decision will short the supply of light crude elsewhere and increase the demand for tar sands and other resource intensive crude with obvious climate impacts. Requiring oil companies to account for tar sands use abroad is the definition of a market-mediated effect. Yet CARB seems more inclined to enforce market-mediated effects against ethanol for land use change than indirect effects against oil companies for heavy crude and tar sands.

To be clear, Iowa farmers are interested in gaining a better understanding of the effects of the energy choices we make. But the *enforcement* of indirect effects of any kind is not warranted.

Some members of the UC scientific community want to include ILUC in the LCFS. But this is not a consensus position. In addition to the 27 signatories of the June 24 letter to CARB, Dr. Michael Wang of Argonne National Laboratory, one of the foremost experts in lifecycle carbon assessment field and author of the GREET model being used as the framework for the LCFS, recently stated, "Indirect land use changes are much more difficult to model than direct land use changes. To do so adequately, researchers must use general equilibrium models that take into account the supply and demand of agricultural commodities, land use patterns, and land availability (all at the global scale), among many other factors. Efforts have only recently begun to address both direct and indirect land use changes ... [w]hile scientific assessment of land use change issues is urgently needed in order to design policies that prevent unintended consequences from biofuel production, conclusions regarding the GHG emissions effects of biofuels based on speculative, limited land use change modeling may misguide biofuel policy development."[6] The signatories of the June 24 letter expressed similar concerns.

[6] See http://www.transportation.anl.gov/pdfs/letter_to_science_anldoe_03_14_08.pdf.

The UC letter signatories dismiss the rationale that ILUC be left out of the LCFS at this time based, in essence, on the assertion that ILUC exists. As stated, all fuels and products have indirect carbon impacts. Yet, zero may in fact be the right number for "indirect effects" in the first version of the LCFS from a public policy perspective if: (1) CARB and UC cannot enforce scientifically defensible numbers because of the lack of verifiable or reliable data or an incomplete understanding of the full spectrum of indirect effects across all fuel pathways; and/or, (2) there are serious unanswered public policy questions about the merits of enforcing indirect effects in a performance-based carbon regulation.

To this latter point, it is worth noting in any discussion about market-mediated, indirect effects the potential to destabilize the advanced biofuels sector with overly aggressive or inequitable compliance metrics against conventional biofuels. It is well understood that conventional biofuels are a cornerstone for the development of advanced biofuels, which includes infrastructural, political, market acceptance and investment risk considerations. Enforcing additional compliance metrics against conventional biofuels will not accelerate the commercialization of advanced biofuels.

The Iowa Farm Bureau appreciates the challenges faced by the CARB as it formulates policy for the LCFS. We believe that it is inappropriate to include ILUC from foreign nations in the LCFS analysis and that inclusion of US-based land use change should be delayed until models are developed for that specific purpose and have been fully vetted. We urge the CARB to reject the use of highly uncertain ILUC numbers that are aimed at selected fuels under the LCFS. Doing so will not create a positive outcome for either the environment or the LCFS policy itself.

We would be happy to address questions or concerns you may have, and appreciate your leadership on this important endeavor.

Sincerely,

Craig Lang, President
Iowa Farm Bureau Federation