Nos. 12-15131, 12-15135

United States Court of Appeals for the Ninth Circuit

ROCKY MOUNTAIN FARMERS UNION, ET AL.,
Plaintiffs-Appellees

v.

JAMES N. GOLDSTENE, ET AL.,
Defendants-Appellants

On Appeal from the United States District Court for the Eastern District of California, Fresno Division (O'Neill, J.)
Civil Case Nos. 1:09-02234 and 1:10-00163

BRIEF OF AMICI CURIAE SCIENTIFIC EXPERTS IN SUPPORT OF APPELLEES

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TABLE OF CONTENTS

Page

TABLE OF AUTHORITIES

Page(s)

Cases

Statutes

Regulations

Other Authorities

INTRODUCTION

This case involves a legal challenge to the Low Carbon Fuel Standard ("LCFS") adopted by the California Air Resources Board ("CARB"). At the outset of its Opening Brief to this Court, CARB contends that the LCFS is based "on a neutral, widely accepted scientific methodology" for calculating the greenhouse gas emissions over the "full lifecycle" of fuels. Appellants' Opening Br. at 1. Unfortunately, the LCFS is not based on sound scientific methodology. To the contrary,

1. CARB's relies on a controversial indirect greenhouse gas emissions model, which is not sufficiently developed to provide the regulatory precision needed to differentiate among biofuels (*see* Part I, pp. 7–15 *infra*);
2. Notwithstanding the flaws in the model itself, CARB uses outdated data and flawed scientific inputs that further undermines the scientific validity of the LCFS (*see* Part II, pp. 15–21 *infra*); and

3. CARB's methodology discriminates against biofuels, disrupting the careful balance that Congress struck for encouraging alternative fuels (*see* Part III, pp. 22–26 *infra*).

For these reasons, CARB should not, and should not be permitted to, over-ride the carefully-constructed Congressional program for encouraging alternative fuels based on an obsolete, flawed, and discriminatory scientific approach.

RULE 29(c)(5) STATEMENT

No party's counsel authored this brief in whole or in part. No party, or any party's counsel, contributed any money that was intended to fund preparing or submitting this brief. Royal DSM, a Dutch company with an interest in biofuels, will contribute $15,000 to the Center for Law, Science & Innovation at Arizona State University in recognition of the efforts of the attorneys involved in writing this brief. Those funds will be used to help underwrite an academic conference or workshop in 2013 on a topic to be determined. The two attorneys authoring this brief (Abbott and Marchant) are affiliated with the Center for Law, Science & Innovation at ASU, but wrote this brief in their own independent capacity as individual researchers and

attorneys. This brief does not necessarily represent the views of the Center for Law, Science & Innovation, the Sandra Day O'Connor College of Law, or Arizona State University.

INTEREST OF AMICI CURIAE

Amici curiae Dr. Bruce E. Dale, Dr. Harvey Blanch, Dr. Sharon P. Shoemaker and Dr. Blake Simmons (collectively "scientific experts") are some of the leading scientists in the United States working on biofuel issues, and in particular the assessment of environmental benefits and impacts of biofuels. The qualifications and interests of the individual amici scientists are briefly summarized below. Pursuant to Fed. R. App. P. 29(a), all parties have consented to the filing of this amicus brief (per the parties' agreed global consent to filing of amicus briefs).

Dr. Bruce E. Dale is a scientist with extensive expertise, training and a national and international reputation in the study of biofuels. He is a Professor in the Department of Chemical Engineering and Materials Science at Michigan State University ("MSU"). He also leads research activities in the Department of Energy's ("DOE") Great Lakes Bioenergy Research Center, one of three major centers funded by the DOE to develop non-food based biofuels. Professor Dale has a Ph.D. in chemical engineering from Purdue University as well as Bachelors

(with highest honors) and Masters degrees from the University of Arizona in chemical engineering. He has studied biofuels derived from non-food (cellulosic) biomass for over 30 years, and for the past decade has used life cycle assessment ("LCA") to analyze and improve the environmental performance of biofuels. He has published well over 200 peer-reviewed scientific papers on the subject of biofuels, and has been recognized as one of the nation's leading scientific experts on biofuels, as demonstrated, for example, by being invited to co-chair the National Research Council ("NRC") Committee on Biobased Industrial Products: National Research and Commercialization Priorities (1994-1997), serving on other scientific advisory committees for the NRC and other governmental and non-governmental bodies, testifying to Congress on biofuels on numerous occasions, and serving as the editor-in-chief of the journal *Biofuels, Bioproducts and Biorefineries.* His interest in this litigation is to ensure that CARB's life-cycle assessment of biofuels is undertaken in a scientifically credible and robust manner.

Dr. Harvey Blanch is a Professor at the University of California Berkeley in the Department of Chemical and Biomolecular Engineering. He has over 35 years experience in the production of biofuels. He is the

Chief Science and Technology Officer of the Joint Bioenergy Institute, one of three DOE-supported bioenergy research centers that focus on the conversion of lignocellulosic biomass to fuels. He is the principal investigator of the Advanced Biofuels Process Demonstration Unit at the Lawrence Berkeley National Laboratory. Professor Blanch holds a PhD from the University of New South Wales and a BS degree from the University of Sydney, both in chemical engineering. He has published a number of peer-reviewed manuscripts on the techno-economic analysis of biofuels production and their life cycle assessment. He is the author of over 350 peer-reviewed publications, and co-author of a widely-used textbook on biochemical engineering. He is a member of the US National Academy of Engineering and is the recipient of awards from the American Institute of Chemical Engineers and the American Chemical Society. His interest in this litigation is to ensure the scientific rigor of indirect land use change assessment of fuels in CARB's regulations.

Dr. Sharon P. Shoemaker is the Executive Director of the California Institute of Food and Agricultural Research at the University of California Davis. She received her Ph. D. from Virginia Polytechnic

Institute and State University. Dr. Shoemaker is the author of several patents on novel yeast strains to convert biomass-to-ethanol and novel bacterial strains to produce new forms of cellulose. She is currently researching the application of cellulases in biomass conversion (e.g. rice straw, wood, missed waste paper), the integration of various unit operations in biomass conversion processes (membrane filtration, enzymes) and the development of new analytical methods for quantifying specific cellulose activities.

Dr. Blake Simmons is a Deputy Director of the Biological and Materials Science Center at Sandia National Laboratories. He also serves as the overall Biofuels Program Lead for Sandia and manages efforts in the biochemical, thermochemical, and chemical conversion of biomass into biofuels and co-products. A chemical engineer by training, his expertise includes biomass pretreatment, enzyme engineering, biofuel cells, nanomaterials, microfluidics, desalination, and silica biomineralization. He is leading the Deconstruction team at the DOE Joint BioEnergy Institute in the development of new processes and technologies to efficiently liberate monomeric sugars from a wide range of biomass feedstocks.

ARGUMENT

The life-cycle assessment that underlies the LCFS is not scientifically credible. CARB purports to base its regulation on "neutral" and "widely accepted" scientific methodology. This assertion is demonstrably incorrect. CARB has over-reached in applying indirect land use changes ("ILUC") modeling far beyond what is accepted in the scientific community. ILUC modeling cannot yet be reliably used to differentiate between fuels (*see* Part I *infra*). Also, CARB has based its LCFS regulation on outdated data and flawed model inputs (*see* Part II *infra*), and has discriminated against biofuels in its methodology by applying a biased, and decidedly non-neutral approach (see Part III *infra*).

I. LIFE CYCLE ASSESSMENT OF INDIRECT EMISSIONS IS NOT SUFFICIENTLY DEVELOPED TO PROVIDE THE REGULATORY PRECISION NEEDED TO DIFFERENTIATE AMONG BIOFUELS

A. There is No Scientific Consensus on the Validity of, or Approach to, ILUC Analysis

CARB proposes to classify and regulate fuels in its LCFS based on the "carbon intensity" of the fuel, which it defines based on the lifecycle greenhouse gas emissions in the production, distribution and use of a

given fuel. All ethanol has the same emissions characteristics at the use stage, so CARB differentiates ethanol sources from each other and from other fuels based primarily on the lifecycle emissions of their production and distribution pathways. A critical but controversial factor in the lifecycle emissions that CARB attributes to different advanced biofuel sources is the so-called indirect land-use change associated with production of that fuel. Briefly stated, the ILUC methodology attempts to estimate greenhouse gas emissions associated with new land uses that result from the dedication of other land to production of biofuels. For example, if land that was previously used to grow food or feed was instead used to produce corn for biofuel production, presumably the resulting corn shortfall would be replaced by an increased cultivation of substitute food crops on other lands in the U.S. or internationally, resulting in some incremental greenhouse gas emissions.

ILUC analysis is a controversial and immature modeling tool that has not yet been validated as a reliable and widely accepted scientific methodology. As a panel of academic and government biofuel experts caution, "[i]ndicators of land-use change are controversial because there

is no consensus on the definition, approach, or validity of the various methods applied to estimate indirect effects."[1]

ILUC cannot be observed directly, and so it must be assessed based on modeling. Modeling ILUC is, however, very challenging and under-developed. Land use change is affected by many different factors, and has complex heterogeneous temporal and spatial dimensions that are difficult to predict and model.[2] Any given land use change is usually driven by several proximate causes and multiple underlying driving forces that interact with each other and differ from site-to-site, making difficult if not impossible any attempt to attribute causation to a single factor.[3] However, CARB's approach to ILUC does attribute causation to one factor: biofuel production. Further adding to the complexity is that the greenhouse gas emissions from any given land use change are highly location-specific, dependent on local factors

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[1] R.A. Efroymson et al., Environmental Indicators of Biofuel Sustainability: What About Context? *Environmental Management* (published online July 24, 2012).

[2] *See eg*, K. Kline et al., In Defense of Biofuels, Done Right, *Issues in Sci. & Tech.*, Spring 2009, at 75, 79.

[3] H.J. Geist & E.F. Lambin, Proximate Causes and Underlying Driving Forces of Tropical Deforestation, 52 *Biosciences* 143, 143-44 (2002).

such as soil type, local climate, and local farming techniques, all of which are extremely difficult to model in any global or regional context. The complexity is exacerbated by the fact that ILUC is not part of the supply chain of the product being studied, but rather is part of another product's supply chain, thus lacking any clear or direct causality and further attenuating the ability to predict and test ILUC effects.

Existing ILUC models fail to address such complexities and tend to over-state the impact of biofuels on land use change, especially in developing nations.[4] More specifically for present purposes, CARB's ILUC model does not follow proper LCA methodology in allocating land use changes between the multiple causes and purposes of these changes, and when such an appropriate allocation is made, the greenhouse gas emissions that CARB attributes to corn ethanol ILUC is reduced by up to 73 percent.[5]

Initial attempts to model ILUC effects on biofuels have produced radically different estimates based on the assumptions and parameters

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[4] *See* Kline et al., *supra*, at 79.

[5] S. Kim, B.E. Dale & R.G. Ong, An Alternative Approach to Indirect Land Use Change: Allocating Greenhouse Gas Effects among Different Uses of Land, *Biomass & Bioenergy* (in press, 2012).

used.[6] Accordingly, there is widespread recognition in the scientific community that additional understanding and reexamination of some of the basic assumptions of the ILUC methodology is needed.[7]

B. ILUC Analysis Misses or Ignores Significant Factors And Cannot Identify A Single "Correct" Value That Can Be Used To Regulate the Use of Biofuels

CARB's LCFS is premised on the capability to credibly assign a "carbon intensity" value to each individual fuel. The value assigned to a given fuel will have enormous economic consequences on the future sales and viability of that fuel in the California market. Yet, the values generated by CARB's LCA methodology, especially with respect to ILUC analysis, are more illusory than real. CARB is able to identify a number of direct and indirect emission factors for various fuels, but is clearly unable to identify or quantify *all* such factors. Many factors are excluded entirely from CARB's analysis because it is not able to

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[6] *See* H. Kim, S. Kim & B.E. Dale, Biofuels, Land Use Change, and Greenhouse Gas Emissions: Some Unexplored Variables, 43 *Environment Sci. Tech.* 961, 961 (2009); G. Oladosu & K. Kline, The Role of Modeling Assumptions and Policy Instruments in Evaluating the Global Implications of U.S. Biofuel Policies, Paper Presented at the 33rd IAEE Int'l Conference, Rio de Janeiro (June 6-9, 2010), at 3.

[7] Oladosu & Kline, *supra*, at 3.

generate any numbers for such factors at this time, while other factors remain controversial, uncertain, and highly-debated within the scientific community.

One clear indication that ILUC analysis is immature and unreliable is that it currently fails to incorporate a number of significant factors. These factors affect different fuels differently, and thus preclude any type of meaningful "apples- to-apples" comparisons of different fuels at this time. For example, some of the important factors *omitted* from current ILUC models would increase the carbon intensity values assigned to various fossil fuels. Thus their omission from CARB's analysis has the effect of incorrectly disfavoring biofuels. Some of these omitted factors that skew the results of CARB's analyses because they would (if properly included) present biofuels in a more favorable comparative light relevant to fossil fuels include: (i) emissions associated with military actions necessary to secure oil supplies; (ii) increased burning of coal as a result of rises in oil prices; (iii) melting of permafrost to release methane that is driven by fossil fuel combustion; (iv) increased absorption of solar energy (more trapped heat) driven by melting of polar ice driven in turn by fossil fuel combustion; and (v)

clearing of land, road building for oil/tar sands exploration, or development.[8]

Thus, although CARB generates ILUC values for different biofuels that appear to have great precision and significance, they are in reality too incomplete and skewed to have real-world significance. This is because CARB incorrectly omits indirect (and some direct) greenhouse gas releases from fossil fuels, while inadequately addressing the complexities of ILUC estimates.

C. CARB Should Be Prohibited From Applying ILUC Factors Until the Science Is Better Established

For the reasons stated above, CARB's ILUC estimates are more phantom numbers than meaningful projections. Given that the ILUC methodology is so difficult to employ and relatively new, there is no consensus among scientists on how such ILUC values should be estimated, or even whether they can be calculated. Thus, contrary to CARB's statement that its scientific methodology is "widely accepted," there "is no consensus on the approach" for estimating ILUC, as stated

[8] *See* CARB Expert Working Group, Subgroup on Indirect Effects of Other Fuels, Low Carbon Fuel Standard – Indirect Effects, Final Report, 2010, available at http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/010511-final-rpt-alternative-modeling.pdf.

in a recently published state-of-the-art review by many leading experts in this field.[9] While additional research and analysis using ILUC is appropriate, ILUC estimates are not adequately validated at this time to provide a reliable foundation for important public policy or regulatory decisions such as the CARB LCFS. As two scientists from the federal Oak Ridge National Laboratory recently stated, "the [existing ILUC] models are still unable to fully address the ILUC implications of biofuels policy. Modeling of U.S. biofuels policy to date has yet to incorporate the dynamics of land use changes over space and time that are essential to generate accurate estimates of LUC emissions."[10]

CARB should not rely on ILUC to discriminate between fuels until it can conduct an "apples-to-apples" comparison and estimate the indirect effects for all fuel pathways, and these indirect effect estimates are capable of reflecting current scientific understanding and empirical results. To do otherwise would do more harm than good by distorting the regulation and markets for biofuels based on, at best, skewed and illusory modeling results. Congress intended to prevent precisely this

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[9] Efroymson et al., *supra*, at *6.
[10] Oladuso & Kline, *supra,* at 6.

type of distortion when it decided not to require lifecycle analysis for emissions from existing ethanol plants to participate in the federal program.[11] CARB is now interfering with that Congressional determination by relying on a flawed ILUC methodology.

II. CARB'S LIFECYCLE AND INDIRECT LAND USE ANALYSIS RELIES ON OBSOLETE DATA AND FLAWED INPUTS

Even if CARB were permitted to apply ILUC to differentiate among fuels, which it should not be, there are serious flaws with how CARB has applied ILUC. Contrary to CARB's assertion that its Low Carbon Fuel Standard is based on "a neutral, widely accepted scientific methodology," CARB's scientific methodology is demonstrably scientifically invalid and uses outdated data and empirically erroneous assumptions.

A. CARB's Analysis Ignored the Most Recent Updates to the "Indirect Land Use Change" Model

There are several problems with CARB's ILUC projections. As an initial matter, CARB's ILUC projections are based on outdated and

[11] 42 U.S.C. § 7545(o)(2)(A)(i).

incorrect data inputs. CARB modified the so-called "GREET" model, developed by Argonne National Laboratory and used by EPA, to create its own "CA-GREET" model. The CA-GREET model lacks the transparency needed to externally evaluate all of the many assumptions and revisions that CARB has made. But from what can be externally evaluated, it is clear that the CA-GREET model is outdated. Unfortunately CARB had declined to update its model with new, lower ILUC estimates.

The estimates of greenhouse gas emissions from indirect land use changes that CARB's regulation employs are derived from the Global Trade Analysis Project ("GTAP") model, a database and computable general equilibrium ("CGE") model for the global economy. The CGE basis for ILUC is un-validated and fundamentally flawed (this is not limited to GTAP). In part, this is because it is predicated on the assumption that either 1) there are no environmental or land use protective regulations in the country of conversion; or 2) existing regulations will not be enforced, both highly presumptuous assumptions. Additionally, the model employs large single-time shocks

rather than more realistic, though more computationally intensive, changes to the market over time, and its projections are un-validated.

But even if otherwise acceptable, the CARB regulations are also problematic in that they expressly adopt the February 2009 version of GTAP.[12] The GTAP model was developed by scientists at Purdue University. In 2010, the Purdue researchers published an updated and corrected version of GTAP, which would reduce the carbon intensity of corn ethanol under CARB's methodology by over fifty percent.[13] This updated model would result in a significant change in the treatment of corn ethanol under CARB's regulatory approach. On May 10, 2010, Growth Energy filed a petition with CARB to revise its regulations to incorporate the updated GTAP estimates. Although CARB has informally indicated that it will consider the new data, it has failed to do so now for over two years, despite undertaking other revisions to the CARB LCFS regulations.

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[12] 17 C.C.R. §95481(a)(20.5).

[13] *See* W.E. Tyner et al., "Land Use Changes and Consequent CO2 Emissions due to US Corn Ethanol Production: A Comprehensive Analysis," Department of Agricultural Economics, Purdue University, July 2010.

CARB's failure to use the best and most recent scientific data and instead to continue to rely on the now outdated 2009 GTAP model is contrary to its own pledge to use "neutral" and "widely accepted" scientific methodology, and the California legislature's direction to use the "best available economic and scientific information" in adopting regulations under the Global Warming Solutions Act of 2006.[14] As this Court has previously held, an agency "acted arbitrarily in failing to utilize the best scientific evidence available."[15] CARB's failure to use the later, lower estimates of ILUC provided by the same Purdue group that generated the earlier, higher ILUC estimates on which CARB relied can *only* be described as "arbitrary and capricious." What other description is possible?

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[14] Cal. Health & Safety Code § 38562(e).

[15] *American Tunaboat Ass'n v. Baldridge*, 738 F.2d 1013, 1017 (9th Cir. 1984). *See also Environmental Defense Fund, Inc. v. Costle*, 578 F.2d 337, 344 (D.C. Cir. 1978) ("Regulation . . . must remain attuned to our rapidly expanding knowledge and technology . . . ."); *In re Consolidated Salmonid Cases*, 791 F. Supp. 2d 802, 821 (E.D. Cal. 2011) ("A failure by the agency to utilize the best available science is arbitrary and capricious.") (citing *Pac. Coast Fed'n of Fisherman's Ass'ns. v. Gutierrez,* 606 F. Supp. 2d 1195, 1216–17 (E.D. Cal. 2008)).

B. CARB's Approach to ILUC Modeling is Based on Invalid Science

It is important for the Court to understand that CARB's ILUC estimates are not based on empirical, measured data. Instead, CARB relies on a model that is based on "unverified assumptions" and "questionable" parameters.[16] While the need to use models and assumptions is understandable, a scientific body or regulatory agency that uses such a model that is not empirically based should seek to test its model against empirical data whenever possible, and to revise or replace its model if it produces outputs that are inconsistent with empirical measurements.

CARB's ILUC model can and has been empirically tested, and has been found wanting, yet CARB continues to rely on its flawed model nonetheless. CARB's model estimates ILUC by predicting changes in grain export patterns and changes in land use worldwide; but for corn ethanol these predictions have been tested and found deficient. For example, contrary to the predictions of the CARB model, there was no

[16] Kline et al., *supra*, at 76.

loss of grain to exports associated with the five-fold increase of corn between 2001 and 2009.[17]

Furthermore, the empirical evidence does not show any evidence of significant land use changes as a result of the increased use of corn for fuel.[18] These are not minor discrepancies or "noise" in CARB's model, but rather these findings empirically refute the core assumptions and predictions of the CARB ILUC approach. CARB's ILUC approach would be used to penalize corn ethanol sources under the LCFS regulation. It is therefore arbitrary and capricious for CARB to continue to rely on such a discredited model that does not conform to the real world in its most fundamental aspects. [19]

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[17] *See* Oladosu & Kline, *supra*, at 3.

[18] Kline et al., *supra*, at 79; Oladosu & Kline, *supra*, at 3-4; Kim, Kim & Dale, *supra*, at 961-62; S. Kim & B.E. Dale, Indirect Land Use Change For Biofuels: Testing Predictions and Improving Analytical Methodologies, 35 *Biomass and Bioenergy* 3235, 3235–40 (2011).

[19] *Chemical Manufacturers Ass'n v. EPA,* 28 F.3d 1259, 1265 (D.C. Cir. 1994) ("If we are to earn our keep, however, judicial deference to the agency's modeling cannot be utterly boundless; we must reverse the agency's application of the generic air dispersion model as arbitrary and capricious if there is simply no rational relationship between the model and the known behavior of the hazardous air pollutant to which it is applied."); *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998) ("An agency's use of a model is arbitrary if that model

(Continued…)

A defining aspect of good scientific practice is the empirical testing of hypotheses and models. As the U.S. Supreme Court has recognized, "Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry."[20] The empirical tests that have falsified CARB's ILUC model demonstrate that it is fatally flawed and deficient in its current formulation. Yet, rather than rejecting or revising its model, CARB has chosen to ignore the empirical data and instead to adhere to a now invalidated model. This methodology of elevating models and "best guesses" over actual empirical data stands the scientific method on its head—models should conform to empirical data rather than the reverse.[21]

'bears no rational relationship to the reality it purports to represent.") (citing *American Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1005 (D.C. Cir. 1997)).

[20] *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 593 (1993) (citation and quotation omitted).

[21] *Chem. Mfrs. Ass'n*, 28 F.3d at 1266 ("We can hardly say that the EPA has demonstrated that its generic air dispersion model bears a rational relationship to the physical properties of MDI when the agency itself disdains making any effort to do so."); *Tex Tin Corp. v. EPA*, 992 F.2d 353, 354-55 (D.C. Cir. 1993) (EPA's reliance upon generic studies in face of conflicting detailed and specific scientific evidence held arbitrary and capricious).

III. CARB'S LIFE CYCLE ASSESSMENT DISCRIMINATES AGAINST BIOFUELS AND INTEFERES WITH CONGRESS'S OBJECTIVE TO PROMOTE SUCH FUELS

A. CARB's Methodology Fails to Provide a Fair Comparison of Biofuels Such as Ethanol with Other Fuels

Comparative life-cycle assessment will mislead rather than inform the State of California and the United States if CARB does not compare all fuel production projects and processes on the same basis. CARB's LCA methodology unfortunately does not provide such an even-handed comparison. Instead, CARB discriminates against biofuels by estimating ILUC factors for crop-based biofuels but not considering indirect effects for fossil fuels. Specifically, CARB fails to evaluate all petroleum, CNG, and other fossil fuel pathways for the indirect effects that CARB applies to ethanol pathways. Again, this approach can only be described as arbitrary and capricious and could result in perverse effects.

This discriminatory practice of calculating indirect effects of one set of fuels, but not other fuels against which they are compared, is also flatly inconsistent with established good LCA practice, and yet CARB claims to be following good LCA practice. As a recently published review concluded, "the ILUC indicators are not equitably applied in

comparative decision contexts for all fuel alternatives . . . . Many land-use, soil quality, and biodiversity effects associated with fossil fuels are more certain, enduring, and extensive than those postulated for biofuels . . . . However, regulatory frameworks commonly focus disproportionately on new technologies and products like biofuels rather than older alternatives."[22] The Congressional decision to exempt existing ethanol fuel investments from ILUC was intended to protect this important source of biofuels from just this type of discrimination.

CARB's own expert Subgroup on Indirect Effect of Other Fuels recently released a consensus recommendation that the LCFS "should score fuels symmetrically in terms of their evaluation of direct and indirect effects, thereby creating a level playing field for all fuel types."[23] CARB has to date refused to create such a level playing field, continuing to apply ILUC to corn ethanol but failing to consider indirect effects of other fuels. A regulatory agency's discretion "is not a license

[22] Efroymson et al., *supra*,*6.
[23] CARB Expert Working Group, *supra*, at 3.

to . . . treat like cases differently.[24] As a result of its discriminatory approach, CARB overestimates the indirect greenhouse gas emission impacts of corn ethanol, while underestimating those due to fossil fuels. The consequence is to discriminate against fuels such as ethanol and frustrate the goal of Congress to promote such fuels.

B. CARB's Methodology Does Not Promote Better Land Use Decisions or Better Environmental Outcomes

CARB's ILUC methodology has counter-productive impacts on land use practices that affect greenhouse gas emissions and other environmental attributes. CARB's model does not consider, and thus does not incentivize, good land use practices such as use of cover crops and more sustainable tilling practices. Adoption of these practices could provide substantial greenhouse gas emission reduction benefits.[25] By failing to consider these important factors in biofuel production, CARB penalizes responsible and less responsible ethanol producers alike.

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[24] *County of Los Angeles v. Shalala*, 192 F.3d 1005, 1022 (D.C. Cir. 1999).

[25] B.E. Dale et al., Biofuels Done Right: Land Efficient Animal Feeds Enable Large Environmental and Energy Benefits, 44 *Environment, Sci. Tech.* 8385 (2010); Kim, Kim & Dale, *supra*, at 961-62.

Moreover, by disproportionately penalizing corn ethanol relative to other biofuels, CARB's flawed methodology is likely to lead to more importing of cane ethanol and exporting of corn ethanol, again resulting in a negative environmental impact. Because Brazilian ethanol made from cane sugar receives a more beneficial score under CARB's methodology, fuel providers will be incentivized to import more Brazilian ethanol to meet California's LCFS requirements. Ironically, Brazil is likely to then import U.S. ethanol produced from corn to make up its domestic supply deficit that results from its exports to the United States. The result of this fuel shuffling would not be lower greenhouse gas emissions from global biofuel production (which would be relatively unchanged by CARB's policy), but there will be an increase in greenhouse gas emissions from all the transport of biofuels back and forth between Brazil and the U.S. as a result of CARB's policy.

Finally, the current CARB approach to land use analysis "grandfathers" existing land-use patterns, no matter how unsustainable they are. A crop such as corn is grown for a variety of different human uses, with almost seventy percent of the current U.S. corn grown for

animal feed, which has its own issues with sustainability.[26] Yet, CARB's approach grandfathers the other uses of corn, penalizing only corn grown for fuel. CARB's current practice of assigning single values to pathways has failed to incorporate any flexibility in assessing pathways or take into account any changes in practice that may improve sustainability, thus disincentivizing such efforts. A more credible and environmentally-beneficial approach consistent with established good LCA practice would be an allocation approach that partitions the effects of land use choices among basic human needs (e.g., transportation fuel, human food, animal feed, etc).

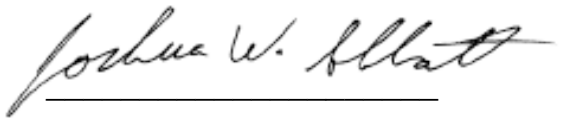
CONCLUSION

CARB's LCFS regulations, and especially the ILUC methodology that drives the regulation of ethanol fuels, does not meet CARB's assertion and legal requirement that it rely on "neutral" and "well-accepted" science. To the contrary, the ILUC methodology is a controversial and unvalidated methodology that does not provide reliable or robust results. CARB has used outdated and invalid inputs

[26] *See* Kim, Kim & Dale, *supra,* at 961-62.

in applying this questionable methodology and has applied the method unequally to discriminate against biofuels.

Respectfully submitted,



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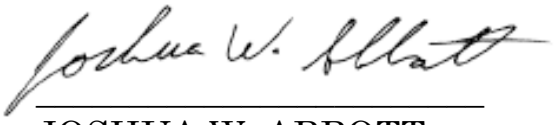
August 13, 2012

CERTIFICATE OF COMPLIANCE

This brief complies with Fed. R. App. P. 29(d) and 32(a)(7)(B). The brief contains 5098 words, excluding the parts exempted by Fed. R. App. P. 32(a)(7)(B)(iii). This brief also complies with Fed. R. App. P. 32(a)(5) and 32(a)(6), as it has been prepared in a 14 point, proportionally spaced roman typeface (Century Schoolbook), using Microsoft Word 2007.

DATED: August 13, 2012



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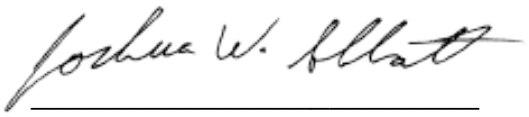
CERTIFICATE OF SERVICE

I hereby certify that I electronically filed the Amici Brief of Scientific Experts in Support of Appellees with the Clerk of the Court for the United States Court of Appeals for the Ninth Circuit by using the appellate CM/ECF system on August 13, 2012. Participants who have not consented to electronic service were served with a hard copy.

DATED: August 13, 2012



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