April 21, 2009

Mary D. Nichols, Chairman
California Air Resources Board
Headquarters Building
1001 “I” Street
Sacramento, CA 95812

RE: Investor Concerns About Enforcement of Indirect Effects in the CA LCFS

Dear Chairman Nichols,

As members of the California clean energy investment community, we appreciate the opportunity to comment on the proposed California Low Carbon Fuel Standard (LCFS), and specifically, to discuss the critical issue of how to address concerns about indirect effects under the regulation.

As a general matter, we commend your leadership and that of the Schwarzenegger Administration in acting to reduce the carbon intensity of California transportation fuels. Most importantly, we support your focus on a performance driven regulation that provides important predictability for clean fuel investors, and attempts to avoid picking winners and losers. As leading investors in advanced biofuels and other transportation solutions, we are sensitive to the need to promote the lowest carbon and most sustainable solutions. In reviewing the LCFS proposal dated March 5, 2009 we noted that the Air Resources Board (ARB) plans to score the different compliance fuels based on their direct “cradle to grave” carbon effects. It also appears that ARB plans to enforce an additional carbon penalty on biofuels for “indirect land use change (iLUC)” based on newly evolved economic modeling. We the undersigned, have significant concerns about the current use of iLUC and its selective application to biofuels.

As investors in a range of low carbon fuel technologies, we want to ensure that fuel options are treated equally and scored with the same level of accuracy, including the petroleum fuel baseline. This is important so that we can invest with a clear understanding of the performance of a particular fuel option under an LCFS. Indirect effects of all kinds, not just land use change, may have significant impacts on the footprint of each fuel option and its viability under an LCFS. Our primary concern is that if indirect effects are included in the regulation that they be studied with equal scope and effort across all fuels before they are applied to any fuels. The current approach, which selectively adds iLUC to biofuels, reduces the carbon benefits of both advanced and conventional biofuels, but leaves significant uncertainty about how the other alternatives will be treated under the regulation and whether the number assigned to biofuels will hold up under further review. This will likely have a significant chilling effect on the development of lower carbon fuels, including advanced biofuels.

At a basic level, we also have increasing concerns about the validity of current indirect effects modeling – specifically for "land use change", which is the only effect currently modeled for the LCFS. According to a wide range of scientific experts in the field, many of whom expressed their concerns about the selective enforcement of indirect effects in a letter dated March 2, the underpinnings of the current iLUC methodology are problematic and may be proved faulty under closer scrutiny.

First, we are concerned that the model itself – called GTAP – is not yet peer-reviewed for its new application as a predictive carbon model, and that GTAP has a documented history of being imprecise. "Indirect land use change" is an outcome derived by adding a predetermined amount of biofuel demand to a static, preset economic model, which in turn projects the potential "price induced" expansion of the agricultural sector onto additional land. It is a useful academic exercise, but as a price model it cannot account for the profit margins that drive real world decision making. As a result, the model is likely to over estimate effects that in reality would be mitigated by market forces, or produce estimates that in many cases are simply wrong. For example, in prior applications of the GTAP methodology, the model predicted changes in land use between 2001 and 2006 that were actually the opposite of the real-world changes observed over time.[1] Unfortunately, ARB is currently relying on this overly simplified modeling methodology to assign indirect land use change penalties that will have very real commercial implications. It is our belief that the modeling methodology needs to be improved and further validated to a point where the level of uncertainty is more akin to other regulatory standards. For example, ARB's on-road emissions model (EMFAC) has been validated by real world carbon monoxide data based on ambient air monitors in tunnels. Conversely, there has been little attempt to validate the inputs or outputs used for the GTAP analysis. There are indications that some of their assumptions may be wrong. For example, GTAP assumes that the productivity of new land being converted is 40% less than existing land. However, this assumption does not square will actual yield and productivity data coming out of Brazil.

Second, we are concerned that the bulk of the modeling to date has been focused on a single fuel option - biofuel. This modeling exercise is being used to increase the carbon score of cellulosic ethanol by ~80 percent, and conventional biofuels by ~40-200% depending on the type of feedstock. It appears that the oil baseline, along with all other alternatives including natural gas, hydrogen, and electrification are assumed to have no indirect effects, even though each fuel certainly has "price induced" carbon effects. For instance, if more natural gas is used for transportation then not only will its price rise, but it must be replaced in the electricity portfolio – some percentage of which is likely to be coal. We believe that any estimates of indirect effects need to be evenly

[1] In an earlier analysis of the impact of biofuels on U.S. land use patterns, researchers at Purdue using GTAP concluded the harvested area for coarse grains like corn would increase 8.3% from 2001 to 2006, U.S. harvested area for oilseeds like soybeans would decline 5.8%, and forested area would decline 1.5% during the same period. In actuality, coarse grain harvested area declined by 2%, oilseed area increased by 0.5%, and forested area increased by 0.6% from 2001 to 2006.

applied across fuel options. Each fuel will have a different set of indirect carbon effects. In some cases those indirect effects will consist primarily of a single impact such as land use change, while in others it will be the sum of many small effects, but the science must be applied with equal diligence across all compliance and baseline options.

Some groups have suggested that the current iLUC modeling would help advanced biofuels. This claim is not accurate. Selective indirect effects enforcement against biofuels makes all biofuels, including advanced biofuels, less competitive against the baseline and other alternatives. As investors we are also concerned because selective enforcement adds risk and uncertainty to the advanced biofuels sector by: (a) destabilizing the conventional biofuel sector, which continues to build the infrastructure and support the technological development that is necessary to allow advanced biofuels to reach commercialization; (b) institutionalizing a regulatory bias against all biofuels and sending mixed regulatory signals to the market, which amplifies market risk and will chill investment in advanced biofuels; (c) artificially limiting the type of feedstock available to advanced biofuel producers, which limits the scalability of emerging advanced biofuel companies. It is not enough to suggest that advanced biofuel companies are helped by the LCFS as long as their carbon scores are lower than that of petroleum. Their advantage is artificially diminished by selective application of indirect effects. Furthermore, investments are based on a much more diverse set of metrics inclusive of regulatory bias, politics, market barriers, science, infrastructure and other risk. In general, asymmetrical application of indirect effect penalties exacerbates investment risk in all biofuels.

We are also aware of the argument that an LCFS without indirect land use change ignores a very real effect of biofuels. However, we feel strongly that zero is not the right number for oil or any other alternative either. Indirect effects come as a consequence of a myriad of worldwide economic, political and social variables, and should not be prematurely and selectively applied to a single option in a performance regulation. An LCFS without indirect effects (i.e. based on direct effects) captures the full well-to-wheels carbon emissions of producing and using various fuels, including the land converted for production of biofuel feedstock. Delaying the assignment of indirect effects will not lead to massive investment in higher carbon conventional biofuels, as some have feared. Investor time horizons are long enough that the risk of future penalties for iLUC will be taken into account.

Our primary concern as investors is that the LCFS provides a fair and enduring set of standards that regulate all fuels on a level playing field. Selective enforcement of indirect effects creates an asymmetry that will have unintended consequences, and creates exactly the kind of regulation that makes investors wary. We believe that an LCFS using direct effects in conjunction with an economy wide carbon regulation such as AB32 has the capacity to address indirect effects as direct effects through clear management of unregulated imports. However, we support several additional strategies to address concerns about indirect effects: (1) a multi-disciplinary assessment of the

indirect, market-mediated carbon effects of all fuels; (2) ongoing improvement of the treatment of direct land use under the GREET model; (3) the design and implementation of a regulatory process by which all fuel producers, including fossil fuel companies, customize the carbon impacts of their fuels, including land intensity. The apparent alternative – using biofuels as a pathway to stretch the traditional carbon assessment boundaries into indirect effects – will be counterproductive for the economic and environmental interests of State of California and will undermine investments in viable near-term solutions to petroleum dependence and climate change.

We appreciate the opportunity to comment on this important regulation and look forward to providing any additional information you might need.

Sincerely,

[alphabetical listing]

Andrew Friendly
Principal, Advanced Technology Ventures

Erik Straser
Partner, Mohr Davidow Ventures

Jason Matlof
Partner, Battery Ventures

Josh Green
Partner, Mohr Davidow Ventures

Kelsey B. Lynn
Principal, Firelake Capital Management LLC

Martin L. Lagod
Managing Director, Firelake Capital Management LLC

Maurice Gunderson
Senior Partner, CMEA Capital

Paul Holland
General Partner, Foundation Capital

Steve Golby
Partner, Venrock

Will Coleman
Partner, Mohr Davidow Ventures