

Nos. 12-15131, 12-15135

IN THE UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

ROCKY MOUNTAIN FARMERS UNION, et al.,
Plaintiffs-Appellees,

v.

JAMES N. GOLDSTONE, in his official capacity as
Executive Director of the California Air Resources Board, et al.,
Defendants-Appellants,

ENVIRONMENTAL DEFENSE FUND, et al.,
Intervenors-Defendants-Appellants.

On appeal from the United States District Court for the Eastern District of California,
Fresno Division, Case Nos. 1:09-cv-02334-LJO and 1:10-cv-00163-LJO,
The Honorable Lawrence J. O'Neill, Judge

BRIEF OF *AMICUS CURIAE*
ECOSHIFT CONSULTING, LLC
In Support of *Defendants-Appellants*

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**RULE 26.1 CORPORATE DISCLOSURE STATEMENT OF
AMICUS CURIAE**

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure:

Amicus curiae EcoShift Consulting, LLC states that no parent or publicly-held corporation owns 10% or more of its stock.

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**STATEMENT OF IDENTITY, INTEREST IN THE CASE AND SOURCE OF
AUTHORITY TO FILE**

Pursuant to Federal Rule of Appellate Procedure 29(c)(4), counsel for *amicus curiae* EcoShift Consulting, LLC (“EcoShift”) certifies as follows:

EcoShift is an environmental consulting firm focused on climate change and sustainability. EcoShift's portfolio includes engagement with climate change and energy policy, specifically life-cycle analysis and the measuring of carbon intensity of transportation fuels. EcoShift has taken a particular interest in the program at issue in this appeal, California's Low Carbon Fuel Standard (“LCFS”); EcoShift sees the LCFS as providing a tremendous opportunity to drive down greenhouse gas emissions in the transportation fuel sector efficiently and economically. EcoShift advises clients and other parties on how to comply with the LCFS and other life-cycle analysis-focused statutes in the United States.

EcoShift therefore has a significant interest in the outcome of this case and the legal issues presented in the Appellants' Opening Brief, filed on June 8, 2012. Because of the importance of the LCFS to EcoShift’s business and to sound climate change policy in the State of California, EcoShift submits this brief to this Court in support of Appellants. Given its substantive expertise in life-cycle analysis and implementation, as well as in fuel technologies, EcoShift submits this brief in the hope that it will be of assistance to this Court.

All parties have consented to the filing of EcoShift's *amicus curiae* brief.

STATEMENT OF AUTHORSHIP AND FINANCIAL CONTRIBUTIONS

No party's counsel has authored this brief in whole or in part. No party or party's counsel contributed money that was intended to fund the preparation or submission of this brief. No person – other than the *amicus curiae*, its members, or its counsel – contributed money that was intended to fund preparing or submitting this brief.

ARGUMENT

I. Introduction

There is a broad scientific consensus that greenhouse gas (“GHG”) emissions – particularly carbon dioxide – from human activities are increasing temperatures at and near the Earth’s surface; that this anthropogenic climate change poses a variety of serious threats to human health, economic welfare, and to natural resources; and that substantial reductions in emissions are required in order to avoid the most damaging global warming scenarios. Major scientific bodies that reflect this consensus include the Intergovernmental Panel on Climate Change, and the major professional and academic societies involved in the study of climate, including those affiliated with the United States government.¹

The transportation sector is a critically important source of emission reductions, as it is among the largest sources of emissions. In California, transportation emissions make up almost 40% of the State’s overall GHG emissions, making them the single largest source of emissions.²

¹ See, e.g., National Research Council Committee on America’s Climate Choices, *America’s Climate Choices* (2011), available at <http://dels.nas.edu/Report/Americas-Climate-Choices/12781>; United States Global Change Research Program, *Global Climate Change Impacts in the United States* 9 (Thomas R. Karl, et al., eds., 2009), available at <http://www.globalchange.gov/usimpacts>; Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66496, 66516 (Dec. 15, 2009); Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report Summary for Policymakers* (2007).

² Appellants’ Opening Br. 14 (citing ER 4:767, 3:458 at ¶ 48, 5:921-922).

The LCFS is designed to incentivize entities providing fuels in California to produce low GHG emission fuels. Like other existing and proposed programs that attempt to limit GHG emissions from transportation fuels, the LCFS relies on life cycle analysis (“LCA”). LCA is a tool that is used to quantify the GHG impact of a fuel from “cradle to grave”—from its extraction through processing and utilization. As Appellants explain, Appellants’ Opening Br. 19-22, LCA is a necessary component of a control on GHGs from fuels because the true GHG impact of different fuels varies significantly; looking at just the combustion stage is inaccurate as the differences can and do arise from all phases of the fuel life cycle prior to combustion, for example, in the removal of carbon dioxide from the atmosphere during feedstock crop growth or by emissions that occur in processing feedstocks into fuel. LCA provides a framework to accurately assess the relative quantities of greenhouse gases emitted due to the use of various fuels.

The policy signal the LCFS sends has become an important driver of investment in low carbon fuels and low carbon production processes, because it provides some assurance that there will be a market for already existing and emerging low carbon fuels.

In the absence of policies that, like the LCFS, account for the differing levels of greenhouse gases emitted, there is little to no explicit economic incentive to produce biofuels that generate lower GHG emissions.³ The LCFS responds to this problem by

³ Other factors, including public policies that explicitly or implicitly subsidize oil production, see, e.g., C. Cecil, *Budget Battles: Would the Obama Administration's Proposal to Eliminate Oil and Gas Tax Subsidies Injure the Industry?*, 8 Pitt. Tax Rev. 209, 212-14 (2011) (describing history of tax incentives for oil and gas production);

providing a clear, predictable economic incentive for lowering GHG emissions from existing biofuels and encouraging the development of new, innovative low GHG fuels and technologies.⁴

II. Low Carbon Fuels are an Important Business Opportunity

There is widespread recognition that significantly reducing GHG emissions from the transportation sector is a key part of any serious effort to reduce national GHG emissions, and that, even apart from climate concerns, increasing scarcity and cost of crude oil makes it imperative to develop alternative fuels. For these reasons, many governments are adopting policies such as low-interest loans, favorable tax incentives, and cash grants to encourage innovation across a broad spectrum of next-generation fuels, from supporting research into making the production of fuel from energy crops such as corn and sugarcane more efficient,⁵ to making second- and third-generation biofuels such as cellulosic and algal technologies more affordable.

Thanks to policies like the LCFS, low carbon fuels are becoming an important

D. Kocieniewski, *As Oil Industry Fights a Tax, It Reaps Subsidies*, New York Times A1 (July 4, 2010), available at <http://www.nytimes.com/2010/07/04/business/04bptax.html> (last accessed June 15, 2012), have impeded the ability of alternative fuel developers to compete.

⁴ The most direct and effective policy for transitioning to low-carbon alternative transportation fuels is to spur innovation with a comprehensive performance standard for upstream fuel producers. See D. Sperling, *et al.*, *Low Carbon Fuel Standards*, 25 *Issues in Science & Technology* 57 (2009). The LCFS provides such a standard.

⁵ See M. Wang, *et al.*, *Energy and Greenhouse Gas Emission Effects of Corn and Cellulosic Ethanol with Technology Improvements and Land Use Changes*, 35 *Biomass and Bioenergy* 1885 (2011).

business opportunity for many firms throughout the nation. A wide variety of different types of biofuels are in production or under development. Second-generation biofuels include the use of feedstocks such as switchgrass, miscanthus, and corn stover, which numerous studies have shown to be capable of significantly reducing the carbon intensity of transportation fuels.⁶ These second-generation biofuels are made from non-food crops or crop residues.

The designation third-generation biofuels is sometimes used to refer to algae-based, microbe-based biofuels, and higher order alcohols, such as bio-butanol, usually produced in a single step process (whereas second-generation biofuels still require multiple stages for processing).⁷ These fuels are in development across the nation as research universities, venture capital startups, and multinational corporations invest in low carbon fuels in response to signals provided by policies such as the LCFS.

III. The Need for Life Cycle Analysis in Controlling GHGs from Transportation Fuels

The amount of greenhouse gases emitted across the entire life cycle of a transportation fuel (production, transportation, and use) is quantified by a measure called “carbon intensity,” defined as GHG emissions per unit of energy. The GHG emissions associated with extraction, processing, and transportation can contribute a significant

⁶ See S. Nain, *et al.*, Production of First and Second Generation Biofuels: A Comprehensive Review, 14 *Sustainable Energy Reviews* 578 (2010).

⁷ See C. Carere, *et al.*, Third Generation Biofuels via Direct Cellulose Fermentation, 9 *International Journal of Molecular Science* 1342 (2008).

portion of the overall GHG emissions associated with the use of a fuel. LCA is a critical tool in these assessments because looking only at a fuel's "tailpipe" GHG emissions affords an inaccurate and incomplete picture of the GHG consequences of utilizing a fuel – and would entirely miss the carbon absorption benefit provided by the crop feedstocks from which biofuels are made.

Like scientific researchers and other governmental entities that have considered means to reduce GHG emissions from the use of transportation fuels, with the LCFS California has recognized that GHG emission reductions must be calculated over the course of a fuel's life cycle. (A policy that attempted to address fuel emissions only by looking at tailpipe emissions could actually end up *increasing* overall emissions.)

Congress embraced the LCA methodology in the Energy Independence and Security Act of 2007 ("EISA"), Pub. L. 110-140, § 202, codified in part in portions of 42 U.S.C. § 7545(o). In EISA, Congress adopted the Renewable Fuel Standard 2 (the "RFS2") to provide more assurances – lacking in the previous federal renewal fuel program – that biofuels perform better than conventional petroleum or other fossil fuel sources from a GHG perspective. See Appellants' Opening Br. 21-22.

The RFS2 and the LCFS both recognize that LCA is necessary to evaluate the true GHG impacts of different transportation fuels, and the LCFS was structured to complement the RFS2. However, the LCFS provides important incentives that the RFS2 alone does not. With the RFS2, all biofuels are placed in broad categories of compliance,

whereas California's LCFS distinguishes among transportation fuels based upon their carbon intensity and establishes a framework that incentivizes producers to lower carbon intensities – such as by increasing efficiency in the production of the fuel or switching to new feedstocks, such as switchgrass or algae. The incremental reward system established through the LCFS creates conditions whereby biofuel producers are encouraged to pursue every economically viable emission reduction improvement available.⁸ The LCFS and the RFS2 address the objective of increasing production of alternatives to oil in different and complementary ways – as both ARB and EPA have recognized. Appellants' Opening Br. 118-120.

IV. The LCFS Incentivizes Investment in Innovative Low Carbon Fuels

The key to the LCFS is its market-based compliance system that incentivizes low carbon fuel production. Every year, fuels offered by each regulated fuel provider are assessed against a carbon intensity standard that will decline each year, resulting in an overall reduction in carbon intensity of 10 percent compared to the pre-program baseline by 2020. See, generally, Appellants' Opening Br. 16-19. Regulated entities whose fuels have carbon intensities lower than the standard will generate credits that they may use for compliance (to offset deficits from fuels with higher carbon intensities), sell to other regulated entities, or bank for future years. Entities whose fuels had an average carbon

⁸ See S. Yeh, et al., Low Carbon Fuel Standards: Implementation Scenarios and Challenges, 38 *Energy Policy* 6955 (2010); See also P.M. Doughman, California's Climate Change Policy: Raising the Bar, 49 *Environment: Science and Policy for Sustainable Development* 34 (2007).

intensity exceeding the standard may comply by using banked credits or purchasing credits from others.

Under the LCFS, therefore, lower carbon intensities directly translate to financial value. This provides an important incentive to improve all aspects of existing biofuel production and to spend the resources required to develop game-changing low carbon fuel innovations.

Owing in part to the incentives offered by new programs like the RFS2 and the LCFS, investors have been migrating to opportunities relating to low carbon fuels. Table 1 below lists a few of the many examples of innovative low carbon fuel companies that have attracted significant investment in the past five years. These investments include grants from the United States Department of Energy and Department of Agriculture, signaling the importance of low-carbon fuel development to federal policymakers. Successfully deploying the fuels developed through these investments, however, requires a market—such as that provided by the LCFS.

Table 1: Examples of investments in low carbon fuels since 2007

<u>Company</u>	<u>Technology</u>	<u>Investment/Key Investors</u>
Abengoa Bioenergy	Cellulosic refinery	\$132.4 million, US Dep't of Energy loan guarantee; ⁹ \$144 million total
Catchlight Energy	Wood-based biofuels	Weyerhaeuser and Chevron Joint Venture ¹⁰
Chromatin	Genetically modified sorghum	\$10 million, BP and Unilever ¹¹
Solazyme	Microalgae	\$52 million from Chevron Technology Ventures and Morgan Stanley ¹²
LS9	Agricultural residues, sorghum, sugarcane syrup	\$4.5 million grant from Florida Opportunity Fund ¹³
Synthetic Genomics	Genetically engineered microbes	\$600 million investment by ExxonMobil in 2009 ¹⁴

⁹ U. Wang, *Biofuel Investments Keep on Coming*, GigaOM (October 25, 2011), available at <http://gigaom.com/cleantech/biofuel-investments-keep-on-coming/> (last accessed June 12, 2012).

¹⁰ J. Murray, *Chevron Investigates Wood-fired Cars*, BusinessGreen (March 4, 2008), available at <http://www.businessgreen.com/bg/news/1806482/chevron-investigates-wood-fired-cars> (last accessed June 12, 2012).

¹¹ *Supra*, Footnote 9.

¹² K. Fehrenbacher, *Investors Fuel Solazyme With \$52M for Algae*, GigaOM (August 9, 2010) available at <http://gigaom.com/cleantech/investors-fuel-solazyme-with-52m-for-algae/> (last accessed June 15, 2012).

¹³ *LS9 Announces Florida Plant Grand Opening and Receives \$4.5 Million From Florida Opportunity Fund*, Market Watch (August 9, 2010), available at <http://www.marketwatch.com/story/ls9-announces-florida-plant-grand-opening-and-receives-45-million-from-florida-opportunity-fund-2012-05-14>, (last accessed June 15, 2012).

¹⁴ K Howell, *Exxon Sinks \$600M Into Algae-Based Biofuels in Major Strategy Shift*, New York Times (July 14, 2009), available at <http://www.nytimes.com/gwire/2009/07/14/14greenwire-exxon-sinks-600m-into-algae-based-biofuels-in-33562.html>, (last accessed June 15, 2012).

<u>Company</u>	<u>Technology</u>	<u>Investment/Key Investors</u>
ZeaChem	Jet and Diesel Fuels from poplar trees	\$40 million, US Dep't of Agriculture grant ¹⁵

Innovation requires capital investment. The LCFS sends a clear signal to the investment community that the market will be more accessible for second- and third-generation biofuels. Some of these fuels are already in commercial production, while others will soon emerge from various pilot programs. The promising technologies and techniques are diverse and not limited to any particular company type, region, or raw materials. For example, Gevo, a Colorado-based company, has developed an innovative method that uses a genetically-modified yeast as a catalyst, converting sugars derived from multiple renewable feedstocks into isobutanol at their Minnesota facility.¹⁶ Using isobutanol as a gasoline additive will lower overall GHG emissions, thereby decreasing the carbon intensity of the consumer transportation fuel most in use today. Without capital investment spurred by LCFS and other policies that reward lower carbon emissions, Gevo's owners and entrepreneur-innovators like them would not be able to continue to introduce new fuels into this important area. The LCFS allows those with a clear vision of a low-carbon future and the know-how to make that vision a reality to have easier access to capital, and to engage in long-term planning.

While encouraging second- and third-generation biofuel production, the LCFS

¹⁵ Supra, Footnote 9.

¹⁶ M. Steil, *Gevo Begins Isobutanol Production*, Minnesota Public Radio (May 24, 2012), available at <http://minnesota.publicradio.org/display/web/2012/05/24/gevo-isobutanol/> (last accessed June 15, 2012).

also has positive impacts on first-generation biofuels. Investments to lower the carbon intensity of corn-based ethanol have included efforts to: 1) use biomass onsite for electricity generation;¹⁷ 2) add corn oil extraction systems; 3) switch from trucks to barge or rail for fuel transportation; 4) improve conversion efficiency (from corn to ethanol); 5) improve energy efficiency of processing equipment; 6) adopt equipment that can cogenerate heat and power, making coal-intensive electricity unnecessary for biofuel production;¹⁸ and 7) capture and remove carbon dioxide emissions from the fermentation process.¹⁹

Even though LCFS applies only to fuels marketed in California, the innovation in low carbon fuels that policies like the LCFS drive is occurring throughout the United States (and overseas). The researchers and companies developing the next generations of alternative fuels are located around the world. *Biofuels Digest's* list of top thirty transformative technologies represents companies from twelve different states, including start-ups from Colorado, Ohio, Massachusetts, and Iowa, as well as companies based in Canada, Europe, and the United Arab Emirates and multinational firms based outside of California such as Dupont and Honeywell.²⁰ The innovations just described will benefit

17 A. Boies, *et al.*, Implications of Local Lifecycle Analyses and Low Carbon Fuel Design on Gasohol Transportation Fuels, 39 *Energy Policy* 7191 (2011).

18 Archer Daniels Midland, LCFS Method 2B Pathway p. 12, available at www.arb.ca.gov/fuels/lcfs/2a2b/apps/adm-15day-rpt-022112.pdf (last accessed June 15, 2012).

19 Y. Xu, *et al.*, Adding Value to Carbon Dioxide from Ethanol Fermentations, 101 *Bioresource Technology* 3311 (2010).

20 Transformative Technologies of 2010, *Biofuels Digest* (June 21, 2010), available at

first-generation biofuel producers across the country, as the LCFS translates low carbon intensities into revenues for low carbon fuel providers. Therefore, claims made in this case that the LCFS functions as a means of economic protectionism for California fuel providers does not have any basis in the reality of the alternative transportation fuels business.

<http://www.biofuelsdigest.com/bdigest/2010/06/21/2010-transformative-technologies-30-announced-by-biofuels-digest> (last accessed June 15, 2012).

CONCLUSION

The LCFS was designed to spark innovation to lower the GHG emissions in transportation fuels, and is in fact doing so. By utilizing LCA, the LCFS ensures that the new fuels in the marketplace are actually serving the vital policy goal: lowering GHG emissions generated by the use of transportation fuels in California in order to reduce hazards from climate change and to increase California's energy security. Relying on a neutral, science-based standard of carbon intensity, the LCFS is about creating transportation fuels that do not harm the Earth's climate, and has nothing to do with protecting California fuel providers from interstate competition. The Court should reverse the district court's judgments and overturn its preliminary injunction.

Respectfully submitted,

/s/Pierre G. Basmaji

Pierre G. Basmaji

CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rule of Appellate Procedure 32(a) and Ninth Circuit Rule 9(c), the undersigned hereby certifies that the attached brief, filed on behalf of EcoShift Consulting, LLC is proportionally spaced, in a typeface of 14 point or more, and contains less than 2700 words exclusive of those materials not required to be counted under Federal Rule of Appellate Procedure 32(a)(7)(B)(iii).

Dated: June 15, 2012

/s/ Pierre G. Basmaji
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PROOF OF SERVICE

I hereby certify that on June 15, 2012 I electronically filed the document BRIEF OF *AMICUS CURIAE* ECOSHIFT CONSULTING, LLC with the clerk of the Court for the United States Court of Appeals for the Ninth Circuit by using the appellate CM/ECF system. Participants in the case who are registered CM/ECF users will be served by the appellate CM/ECF system.

/s/ Pierre G. Basmaji
Pierre G. Basmaji