the energy of innovation™

310 North First Street
Colwich, Kansas 67030
Ph: 316.796.0900
Fax: 316.796.0570
www.icminc.com

April 15, 2009

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: ICM, Inc. Comments on the Proposed California Low Carbon Fuel Standard

Title of CARB Proposal: Notice of Public Hearing to Consider Adoption of a Proposed Regulation to Implement the Low Carbon Fuel Standard (LCFS)

ICM, Inc. applauds the California Air Resources Board (CARB) proposal to reduce motor vehicle fuel carbon intensity by an average of 10% by 2020 as a significant step in establishing precedence for the United States as we begin to reverse our country's contribution to global climate change. With that said, we would caution CARB not to rush to judgment in approval of any LCFS standard for the reduction of motor vehicle fuel carbon intensity in California.

As a leading fuel ethanol process engineering firm with technology in use by 100 of the 180 fuel ethanol production plants in North America, ICM, Inc. respectfully requests that as CARB evaluates the most effective way to curb carbon emissions, the LCFS standard that meets your final approval should include:

- Establishment of a free-market-based system to regulate carbon emissions
- Elimination of lookup tables to determine carbon intensity
- In place of lookup tables, utilization of tools that are currently available to assign carbon intensity values based on individual plant production practices
- Two-year postponement, or outright rejection, of IULC adder decision, preventing flawed carbon accounting policy from undermining our country's only currently available clean, green alternative to gasoline

The following proposal outlines our recommendations to most efficiently categorize carbon intensity values of ethanol by using up-to-date agricultural and process production data, eliminating incorrect and inefficient labeling methods, and eliminating the time-consuming hearings that would be necessary to adjust lookup table values as more efficient production practices further reduced the carbon intensity of ethanol.

CARB Precedents Lead the United States: ICM has recently met with the U.S. Department of Energy; U.S. Environmental Protection Agency; U.S. Department of Energy; and Argonne National Laboratories, developers of the Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) model. In these meetings, we have introduced a two-phase market-based proposal to reduce climate change by lowering the carbon content of motor vehicle fuels through ethanol blended gasoline. This market-based proposal (attached) directly supports President Obama's request of this Congress to send him legislation for a market-based cap on carbon pollution, and it is in line with his March 24, 2009, statement that the cap-and-trade system should take into account regional differences. As President Obama said, we must move into a new energy era, away from polluting energy sources, and toward cleaner energy.

It is ICM's opinion that requiring each fuel ethanol producer to calculate the carbon intensity of their product, rather than assigning carbon intensity through lookup tables based on pathways will be a good first step in that direction. If producers were subject to carbon intensity ratings based on averages, there would be no reason for the higher-carbon-footprint facilities to incorporate new technology to reduce their carbon output. Alternately, those producers who were already below the curve would have no incentive to further reduce their carbon emissions. We believe that a two-step approach that requires each producer to quantify their carbon footprint, and that implements a free-market cap-and-trade system (not a carbon tax system) that moves the market to reward low carbon footprint fuel ethanol production while not rewarding inefficient production methods is the best, fastest, and most judicious method to continue reducing carbon emissions from fuel ethanol production.

Currently, the proposed regulation suggests basing carbon intensity on values in lookup tables for specified pathways. The lookup tables will be developed and modified based the California Energy Commission modified GREET model (called CA-GREET) and the Purdue University Global Trade Analysis Project model (GTAP) for indirect land use change (ILUC) carbon intensity adders. In both cases, it is clear that model results will rely heavily on CARB assumptions and pathway databases contained within the models. These models are subject to frequent change and updating. The proposed regulation states that regulated parties may obtain CARB approval to either modify the CA-GREET model or to generate additional pathways using CA-GREET after a public process. Having spent the better part of a year in developing an up-to-date, user-friendly, business carbon model (the ICM/Econergy Model), ICM's past experience is that any such pathway and lookup table change driven by any carbon model (e.g., CA-GREET) will be at the discretion of the CARB staff or third party contractors retained by CARB to provide model and database recommendations. Any change would also require lengthy public hearings. Experience has shown this to be impractical. Carbon intensities of plant-specific ethanol must be as up-to-date and real-time as possible to recognize real time improvements in agricultural practices, chemical use, crop yields, and improved plant production processes.

We believe that no carbon accounting model should be ever be approved or even endorsed by CARB, including the ICM/Econergy Model. If any carbon accounting model contains all the required elements and pathways, and the calculations and outputs can be verified by CARB, a model should be allowed for use as a tool to determine carbon intensity in what will become a fast-paced carbon trading market. Because the U.S. looks heavily at the precedents set by CARB in establishing national legislation, ICM supports CARB oversight, but not potential regulatory obstructions to efficient business.

Midwest Corn Belt Ethanol: According to Table ES-8 from CARB's recommendation (attached), CARB has determined carbon emissions for the production of corn-based ethanol from the most common Midwest natural-gas-fired dry mill to be 98.40 grams CO2/MJ (including CARB ILUC adder of 30). In comparison, CARB has determined gasoline based on the average crude oil delivered to California to be 95.86 grams CO2/MJ. In this example, Midwest ethanol has higher carbon intensity than gasoline. Such an illogical misrepresentation of Midwest corn ethanol carbon intensity, based on an ILUC adder of 30, would therefore serve to prohibit the blending of typical Corn Belt ethanol with gasoline in California. Regardless of any free-market discussions by CARB staff, the LCFS regulation, as it is intended, will serve as a trade barrier for corn ethanol produced outside of California. Such an approach will not reward the producer of low carbon ethanol; rather it will label

ethanol as good or bad for use in California. Ethanol must be rated and marketed by field-to-wheels-carbon intensity as calculated at each production facility. The free market will place a premium on low-carbon ethanol produced or delivered to the California marketplace, and it will reward the producer, distributor, and blender accordingly.

Brazilian Cane Ethanol: The ICM/Econergy Model calculates carbon intensity of Brazilian cane ethanol (produced with carbon-neutral bagasse) at 26.10 grams CO2/MJ delivered to the United States (with a zero ILUC adder). In comparison CA-GREET represents the carbon intensity of Brazilian ethanol at 73.40 grams CO2/MJ (with CARB ILUC adder of 46.00). ICM considers Brazilian cane ethanol as the gold standard which we are attempting to achieve with the next generation of biomass-fueled ethanol plants that include combined heat and power. A recent visit to Brazil by ICM revealed that total land area is 855 MHa. Of that, 320 MHa is suitable for cultivation, and 54 MHa is currently planted, with 6.2 MHa planted in sugar cane. There is more than enough cultivatable land in Brazil if the demand for sugar or cane ethanol increases. It is acknowledged by Brazilians that rain forest land is not good land for the cultivation of crops. Land use for ethanol feedstock production in Brazil, or anywhere else in the world, is not displacing rain forest. Therefore, we find it impossible to accept the assignment of any ILUC adder except zero for Brazilian cane ethanol.

Recommendations: In his March 24 press conference, President Obama also exclaimed, "…let's get started now. We can't wait." CARB's current LCFS proposal, while well intentioned, establishes bureaucratic impediments that will serve to slow progress in rewarding producers, distributors, and blenders of low carbon motor vehicle fuels. It will force us to wait.

- Due to lack of scientific justification behind inclusion of ILUC for carbon intensity calculations for any source of ethanol (e.g., Midwest corn, Brazilian cane, cellulosic, etc.), ICM recommends that the effort to include IULC adders in carbon lifecycle assessments is rejected, or at least that decision on such ILUC adder or subtractor be suspended for two years. The European Union has suspended any such ILUC inclusion for two years for this exact reason.
- Rather than approve the use of any carbon model or the CA-GREET-driven lookup tables, ICM recommends that CARB Board of Directors directs staff to specify a set of pathways and databases that must be considered in any carbon accounting model to accurately determine the carbon intensity of any source of ethanol. It will then be up to the producer to determine how to most accurately determine the carbon intensity of ethanol to be blended in California.
- ICM recommends a free-market-based solution to driving down carbon intensity in California motor vehicle fuels that rewards the producers, distributors, and blenders of lowest-carbon ethanol.

Respectfully submitted,

David Vander Griend
President and CEO
(316)796-0900

William J. Roddy
Corporate Manager, Environmental Affairs
(316) 977-6232

Table ES-8
Adjusted Carbon Intensity Values
for Gasoline and Fuels that Substitute for Gasoline

Fuel	Pathway Description	Carbon Intensity Values (gCO_2e/MJ)		
		Direct Emissions	Land Use or Other Effect	Total
Gasoline	CARBOB – based on the average crude oil delivered to California refineries and average California refinery efficiencies	95.86	0	95.86
	CaRFG-CARBOB and a blend of 100% average Midwestern corn ethanol to meet a 3.5% oxygen content by weight (approximately 10% ethanol)	96.09	---	96.09 [1]
	CaRFG-CARBOB and a blend of an 80% Midwestern corn ethanol and 20% California corn ethanol to meet a 3.5% oxygen content by weight blend (approximately 10% ethanol)	95.85	---	95.85 [1]
Ethanol from Corn	Midwest average; 80% Dry Mill; 20% Wet Mill; Dry DGS	69.40	30	99.40
	California; Dry Mill; Wet DGS; NG	50.70	30	80.70
	California average; 80% Midwest Average; 20% California; Dry Mill; Wet DGS; NG	65.66	30	95.66
	Midwest; Dry Mill; Dry DGS	68.40	30	98.40
	Midwest; Wet Mill	75.10	30	105.10
	Midwest; Dry Mill; Wet DGS	60.10	30	90.10
	California; Dry Mill; Dry DGS, NG	58.90	30	88.90
	Midwest; Dry Mill; Dry DGS; 80% NG; 20% Biomass	63.60	30	93.60
	Midwest; Dry Mill; Wet DGS; 80% NG; 20% Biomass	56.80	30	86.80
	California; Dry Mill; Dry DGS; 80% NG; 20% Biomass	54.20	30	84.20
	California; Dry Mill; Wet DGS; 80% NG; 20% Biomass	47.44	30	77.40
Ethanol from Sugarcane	Brazilian sugarcane using average production processes	27.40	46	73.40
Electricity	California average electricity mix	124.10	0	41.37 [2]
	California marginal electricity mix of natural gas and renewable energy	104.70	0	34.90 [2]
Hydrogen	Compressed H_2 from central reforming of NG	142.20	0	61.83 [3]
	Liquid H_2 from central reforming of NG	133.00	0	57.83 [3]
	Compressed H_2 from on-site reforming of NG	98.30	0	42.74 [3]
	SB 1505 Scenario; Compressed H_2 from on-site reforming with renewable feedstocks	76.10	0	33.09 [3]

[1] Calculated value; land use part of the value
[2] Adjusted by an EER factor of 3.0 to account for power train efficiency improvements over gasoline engines
[3] Adjusted by an EER factor of 2.3 to account for power train efficiency improvements over gasoline engines