DC/FV

Air Resources Board

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TO: Dr. Gerald W. Bowes, Manager
Toxicology and Peer Review Section
State Water Resources Control Board

FROM: Dean C. Simeroth, Chief
Criteria Pollutants Branch

DATE: October 21, 2008

SUBJECT: REQUEST FOR EXTERNAL PEER REVIEW OF THE LOW CARBON FUEL STANDARD

The California Air Resources Board (ARB) staff requests, by transmittal of this memorandum, that you initiate the process to identify reviewers to provide external scientific peer review of the Low Carbon Fuel Standard (LCFS) regulation, ARB's staff report, and other supporting documentation. The LCFS is built on the concept of assigning an appropriate carbon intensity (CI) value to a regulated party's fuel. The assigned CI value plays a key role in determining whether a regulated party has complied with the LCFS rule and whether the party has generated any credits or shortfalls for its fuel. Because of this, it is important that the methods used for assigning CI values accurately reflect the multiple steps involved in producing, distributing, and marketing the fuel and the extent the regulated party can provide information on such steps. To reflect the full impact of producing the fuel, the CI values also need to be adjusted to account for impacts on the fuel's overall carbon intensity due to changes in land use.

The LCFS will be considered for adoption at ARB's March 26-27, 2009 Board hearing. The staff report, called the Initial Statement of Reasons, will be ready for review at least 45 days prior to the Hearing. The staff of ARB requests that the LCFS regulation and staff report be subject to scientific peer review consistent with Health and Safety Code (H&S) section 57004. Due to the critical timeframe for adopting the LCFS regulation at the March 2009 Board hearing, we must emphasize that the review must be **completed and comments from reviewer(s) received by March 2, 2009**. This will allow ARB staff to review and address the comments prior to our submittal of the peer review results to the California Environmental Policy Council pursuant to H&S section 43830.8(e).

Reviewers should have expertise in the following areas: (1) greenhouse gas (GHG) modeling, (2) land use change modeling; (2) economic impacts analysis; (3) environmental and multimedia impacts analysis; and (4) pollutant credit trading, particularly GHG/carbon trading schemes.

We should note that there may be credit trading and GHG or land use modeling experts from outside the United States, including Great Britain, Australia, and other countries.

There are three attachments to this memorandum:

1. plain English summary of proposal,
2. scientific issues to be addressed, and
3. list of people who have participated in the development of the proposal.

If you have further questions regarding this request or just wish to discuss this matter further, please feel free to contact me at (916) 322-6020 or Floyd Vergara, Manager of the Industrial Section, at (916) 327-5986.

Attachments

cc: Floyd Vergara, Manager
Industrial Section

bcc: Aubrey Sideco, SSD

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Attachment 1

Summary of Proposed Regulation

Executive Order S-01-07 requires the California Air Resources Board (ARB) to draft a Low Carbon Fuel Standard (LCFS) that reduces the carbon intensity of transportation fuels used in California by at least ten percent by the year 2020. This executive order instructed the California Environmental Protection Agency (Cal/EPA) to coordinate activities between the University of California, the California Energy Commission and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, it directed ARB to consider initiating a regulatory proceeding to establish and implement the LCFS. In response to E.O. S-01-07 and as part of its AB 32 program (California Global Warming Solutions Act of 2006), ARB identified the LCFS as an early action item with a regulation to be adopted and implemented by 2010. The ten percent reduction requires the establishment of a standard carbon intensity value against which future reductions can be measured.

The LCFS is based on a system whereby "credits" that are generated from fuels with lower carbon intensity than the standard balance "deficits" that result from the use of fuels with higher carbon intensity than the standard. A regulated party, defined in the draft regulation, is in compliance if the amount of credits is equal to, or greater, than the deficits. Credits and deficits are determined based on the amount of fuel sold, the carbon intensity of the fuel, and the efficiency by which a vehicle converts the fuel into useable energy. The calculated metric is tons of greenhouse gas emissions. This determination is made for each year between 2010 and 2020. Credits may be banked and traded within the LCFS market to meet obligations.

The LCFS is based on the use of alternative fuels to conventional gasoline and diesel fuel. Alternative fuels include, but are not limited to, biofuels such as ethanol, biodiesel, and renewable diesel fuel; compressed and liquefied natural gas; liquefied petroleum gas; hydrogen; and electricity. Each of these fuels will have carbon intensity values associated with the lifecycle analysis that will ultimately include any indirect effects. To date, ARB staff has published draft lifecycle analyses for eight fuel pathways. The published draft analyses do not include indirect effects. These analyses are being conducted separately.

It is essential that the LCFS rulemaking be presented for external scientific peer review due to the sensitive nature of the LCFS rulemaking and its implication for future climate change programs in California to be developed pursuant to AB 32 (Stats. 2006, ch. 488), AB 1493 (Stats. 2002, ch. 200), and other climate change-related legislation.

Attachment 2

Scientific Issues to be Addressed

Health and Safety Code section 57004 states that the scientific peer reviewer's responsibility is to determine whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices.

We request that you make this determination for each of the following issues that constitute the scientific basis of the proposed regulatory action. An explanatory statement is provided for each issue to focus the review.

1. **Greenhouse Gas Modeling.** The Low Carbon Fuel Standard (LCFS) is built on the concept of assigning a carbon intensity (CI) value to each fuel. The assigned CI value plays a key role in determining whether a regulated party has complied with the LCFS rule. The Air Resources Board (ARB) staff designed CI lookup tables that are a set of categorized and predefined CI values for various fuels. ARB staff calculates the lookup table values by running the California-modified Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) model, using available generic fuel-pathway information for each fuel or fuel blendstock. The lookup table values vary with the source of the fuel, the processing of feedstock and fuel, and other important parameters that affect the total CI for the fuel based on its "source-to-wheel" life cycle. ARB staff is proposing to use the California-modified GREET1 model (v. 1.8b). The 2010 baseline carbon intensities for gasoline and diesel were calculated using the CA-modified GREET model, available at www.arb.ca.gov/fuels/lcfs/lcfs.htm.

2. **Land Use Modeling.** Since GREET does not account for indirect land use changes, a separate model must be employed for this purpose. ARB staff is proposing to use the Global Trade Analysis Project (GTAP) model to assess indirect land use changes, which will also be available at the internet site shown above.

3. **Economic Impacts.** The staff report must present the economic impacts of the rulemaking. The reviewers of the LCFS staff report must assess the economic impacts of the regulation. This assessment must include the impact on fuel operations and maintenance, imports, and the producibility of the likely alternative fuels.

4. **Environmental and Multimedia Impacts.** The reviewers of the LCFS must asses the environmental and multimedia impacts of the LCFS regulation. The staff report must present any significant adverse impacts on public health and the environment, including impacts to air, water, and soil.

5. **Credit Trading.** The LCFS includes a flexible combination of fuel-vehicle systems and awards credits to the fuel provider if the total emissions generated by the supply and consumption of the fuel are below those of the corresponding reference gasoline or diesel standard. Beginning 2010, regulated parties could start generating credits on a quarterly basis. These credits can be banked indefinitely, used for compliance purposes, sold to other regulated parties, and purchased and retired by regulated parties. In addition, the credits can be exported to other GHG emissions reductions programs such as AB 32, subject to the requirements of these GHG programs. Reviewers of the LCFS must assess credit trading proposed in the regulation, including innovation credits, credit borrowing, offset/opt-in credits, and the LCFS credit-banking-and-trading scheme that balances stakeholder inputs with program goals.

The Big Picture

Reviewers are not limited to addressing only the specific issues presented above, and are asked to contemplate the following questions:

- In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule not described above? If so, please comment with respect to the statutory language given above.

- Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed Board action. At the same time, reviewers also should recognize that the Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, reviewers are encouraged to focus feedback on the scientific issues that are relevant to the central regulatory elements being proposed.

Attachment 3

Participants in Development of Proposal*

Consultants

Dr. Sonia Yeh	University of California, Davis
Dr. Bryan Jenkins	University of California, Davis
Dr. Dan Sperling	University of California, Davis
Dr. Michael O'Hare	University of California, Berkeley
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Thomas Hertel	Purdue University
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Working Group Subgroup Members

Christina Zhang-Tillman	Air Resources Board
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Robert Larson	U. S. Environmental Protection Agency
McKinley Addy	California Energy Commission
Jennifer Pont (TIAX, LLC)	California Energy Commission
Michael Wang	Department of Energy
Stefan Unnasch	Life Cycle Associates LLC
Richard Plevin	Life Cycle Associates LLC

* No person may serve as an external scientific peer reviewer for the scientific portion of the rule if that person participated in the development of the scientific basis or scientific portion of the rule.