TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF A PROPOSED REGULATION TO IMPLEMENT THE LOW CARBON FUEL STANDARD

The Air Resources Board (the Board or ARB) will conduct a public hearing at the time and place noted below to consider adoption of a regulation to implement the Low Carbon Fuel Standard (LCFS). The LCFS is intended to reduce, on a full-fuel, life-cycle basis, the carbon intensity of transportation fuels used in California.

DATE: April 23 - 24, 2009

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the ARB, which will commence at 9:00 a.m., April 23, 2009, and may continue at 8:30 a.m., April 24, 2009. This item may not be considered until Friday, April 24, 2009. Please consult the agenda for the meeting, which will be available at least 10 days before April 23, 2009, to determine the day on which this item will be considered.

If you require special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by Fax at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed adoption of California Code of Regulations, title 17, new sections 95480, 95480.1, 95481, 95482, 95483, 95484, 95485, 95486, 95487, 95488, and 95489. The following documents and computer models would be incorporated in the regulation by reference: (1) ASTM D6751-08, “Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels;” (2) ASTM D4806-08, “Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel;” (3) ASTM D975-08ae1, “Standard Specification for Diesel Fuel Oils;” (4) ASTM D7467-08, “Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20);” (5) ASTM E29-08, “Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications;” (6) the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation model, modified to incorporate California-specific data (“CA-GREET”), version 1.8b; (7) the Global Trade Analysis

Project (GTAP) Model; (8) "Renewable Energy Program: Overall Program Guidebook," 2nd Ed., California Energy Commission, Report No. CEC-300-2007-003-ED2-CMF, January 2008; and (9) "Guidance Document and Recommendations on the Types of Scientific Information Submitted by Applicants for California Fuels Environmental Multimedia Evaluations (Revised June 2008)," University of California, Davis, University of California, Berkeley, and Lawrence Livermore National Laboratory, available at http://www.arb.ca.gov/fuels/multimedia/080608guidance.pdf.

Background:

In 2006, the Legislature passed and Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (Assembly Bill 32; Stats. 2006, chapter 488). In Assembly Bill (AB) 32, the Legislature declared that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The Legislature further declared that global warming will have detrimental effects on some of California's largest industries, including agriculture and tourism, and will increase the strain on electricity supplies. While national and international actions are necessary to fully address the issue of global warming, the Legislature recognized that action taken by California to reduce emissions of greenhouse gases (GHG) will have far-reaching effects by encouraging other states, the federal government, and other countries to act. AB 32 creates a comprehensive, multi-year program to reduce GHG emissions in California, with the overall goal of restoring emissions to 1990 levels by the year 2020. AB 32 requires ARB to take actions that include:

- Establishing a statewide GHG emissions cap for 2020, based on 1990 emissions;
- Adopting a scoping plan by January 1, 2009, indicating how emission reductions will be achieved from significant GHG sources via regulations, market mechanisms, and other actions;
- Adopting a list of discrete, early action GHG emission reduction measures by June 30, 2007, which can be implemented and enforced no later than January 1, 2010; and
- Adopting regulations by January 1, 2010, to implement the measures identified on the list of discrete early action measures.

In 2007, Governor Schwarzenegger signed Executive Order S-01-07. This executive order directed the ARB to determine if an LCFS for transportation fuels used in California can be adopted as a discrete early action measure pursuant to AB 32.[1] If ARB so determines, Executive Order S-01-07 directs ARB to consider adoption of the LCFS on the list of early action measures required to be identified by June 30, 2007, pursuant to Heath and Safety Code section 38560.5. Executive Order S-01-07 further

[1] In addition to substantially reducing GHG emissions from transportation fuels, the LCFS is expected to help diversify the transportation fuels market in California, thereby cutting petroleum dependency and creating a sustainable and growing market for cleaner fuels. Governor's White Paper, *The Role of a Low Carbon Fuel Standard in Reducing Greenhouse Gas Emissions and Protecting Our Economy*, <http://gov.ca.gov/index.php?/fact-sheet/5155/>.

directs the ARB to draft the LCFS so that it reduces the carbon intensity of transportation fuels used in California by at least 10 percent by the year 2020.

In 2007, the Board approved a list of nine discrete early action measures. The list includes a measure entitled "Low Carbon Fuel Standard." The proposed regulation is designed to implement this measure pursuant to the requirements of AB 32 and Executive Order S-01-07.

Description of the Proposed Regulatory Action:

Overview

The proposed regulatory action would reduce GHG emissions by reducing the carbon intensity of transportation fuels used in California by an average of 10 percent by the year 2020. Carbon intensity is a measure of the direct and indirect GHG emissions associated with each of the steps in the full fuel cycle of a transportation fuel (also referred to as the "well-to-wheels" for fossil fuels, or "seed or field-to-wheels" for biofuels). Depending on the circumstances, GHG emissions from each step can include carbon dioxide (CO_2), methane, nitrous oxide (N_2O), and other GHG contributors. Moreover, the overall GHG contribution from each particular step is a function of the energy that the step requires. Thus, carbon intensity is typically expressed in terms of grams of CO_2 equivalent per mega-Joule (grams CO_2E/MJ).

The LCFS achieves a 10 percent reduction in average carbon intensity by starting specified providers of transportation fuels (referred to as "regulated parties") at an initial level and incrementally lowering the allowable carbon intensity for transportation fuels used in California in each subsequent year. A regulated party's overall carbon intensity for its pool of transportation fuels would then need to meet each year's specified carbon intensity level. Regulated parties can meet these annual carbon intensity levels with any combination of fuels they produce or supply and with LCFS credits acquired in previous years or from other regulated parties.

Applicability, Regulated Parties, and Fuels

In general, the regulation places compliance obligations initially on regulated parties that are upstream entities (i.e., producers and importers that are legally responsible for the quality of transportation fuels in California), rather than downstream distributors and fueling stations. However, under specified conditions, the regulated party may be another entity further downstream that can be held responsible for the carbon intensity of the fuels or blendstocks that they dispense in California.

For gasoline, diesel, and other liquid blendstocks (including oxygenates and biodiesel), the regulated party will generally be the producer or importer of the fuel or blendstock. With regard to compressed and liquefied natural gas derived from petroleum sources (fossil compressed natural gas (CNG) and fossil liquefied natural gas (LNG), respectively), the regulated party for fossil CNG will generally be the utility company,

energy service provider, or other entity that owns the fuel dispensing equipment; for fossil LNG, it is the entity that owns the fuel when it is transferred to the fuel dispensing equipment in California. For other gaseous fuels (biogas/biomethane, hydrogen), the regulated party will generally be the person who produces the fuel and supplies it for vehicular use. For electricity, the regulated party will be either the load service entity (LSE) supplying the electricity to the vehicle or another party that has a mechanism to provide electricity to vehicles and has assumed the LCFS compliance obligation. The proposal specifies the criteria under which a person would be deemed a regulated party for each particular fuel and how the responsibility of complying with the LCFS can be transferred.

With respect to the fuels, the LCFS applies, either on a compulsory or opt-in basis, to most types of fuels used for transportation in California, including:

- California reformulated gasoline;
- California diesel fuel;
- Compressed or liquefied natural gas;
- Electricity;
- Compressed or liquefied hydrogen;
- Any fuel blend containing hydrogen;
- Any fuel blend containing greater than 10 percent ethanol by volume;
- Any fuel blend containing biomass-based diesel;
- Neat denatured ethanol;
- Neat biomass-based diesel; and
- Any other liquid or non-liquid fuel not otherwise exempted from the regulation.

Voluntary Opt-In Provision

The proposed regulation includes an opt-in provision for certain alternative fuels that have full fuel-cycle carbon intensities that inherently meet the proposed compliance requirements through 2020. These fuels are electricity, hydrogen and hydrogen blends, fossil CNG derived from North American sources, biogas CNG, and biogas LNG. Regulated parties for these fuels are required to meet the LCFS requirements (e.g., reporting, credit balancing) only if they elect to generate credits based on these fuels as provided under the proposal. Generally, parties that opt into the LCFS program will be those parties that expect to generate LCFS credits under the regulation. By opting into the program, a person becomes a regulated party under the LCFS regulation and is required to meet the LCFS reporting obligations and requirements. The provisions for opting into the LCFS are set forth in the proposal.

Exemptions

The proposal exempts any alternative fuel that is not biomass-based or renewable biomass-based and for which the aggregated volume by all parties for that fuel is less than 420 million mega-Joules per year (3.6 million gasoline gallon equivalent per year). This is intended to exempt research fuels entering the market or very low volume niche

fuels. Also, the proposal does not apply to regulated parties providing liquefied petroleum gas (LPG or propane).

There is also an exemption for specific applications of transportation fuels, including fuels used in aircraft, racing vehicles, interstate locomotives, ocean-going vessels, and military tactical vehicles. However, it is important to note that this exemption does not apply to *intra*state locomotives and commercial harborcraft, for which the diesel fuel is already subject to the requirements in California Code of Regulations, title 17, section 93117 (i.e., required to use on-road California diesel). Because of this, the diesel fuel sold or offered for sale for use in intrastate locomotives and commercial harborcraft subject to California Code of Regulations, title 17, section 93117, would be treated the same as any other transportation fuel subject to the LCFS.

Transfer of Compliance Obligations and Regulated Party Status

As noted, certain persons are initially designated as regulated parties who are responsible for the LCFS compliance obligations. Except as provided in the proposal, this status as a regulated party generally remains with the initially designated party even if ownership to the fuel is transferred from one party to another. There are two major exceptions to this general rule. For California Reformulated Gasoline Blendstock for Oxygenate Bending (CARBOB) and diesel fuel, the compliance obligations would generally transfer to another producer or importer that receives CARBOB or diesel fuel from the initial regulated party, with provisions for the initial regulated party to retain the compliance obligation if so desired by the affected parties.

The principal rule noted above notwithstanding, the proposal generally allows the regulated party for a fuel to transfer its compliance obligations by written instrument to another party under specified conditions; the buyer or recipient of the transferred fuel, in turn, becomes the regulated party for that fuel. For a variety of reasons, the transfer of such compliance obligations, along with the potential for generating and selling credits, may be desirable for a company, and the proposal allows such transfers.

Fuel Pool Carbon Intensity Requirements

As noted, the LCFS achieves the goals of Executive Order S-01-07 by incrementally reducing the allowable carbon intensity of transportation fuel used in California. The LCFS does not limit the carbon intensity of individual batches or types of fuels, but it does require regulated parties to comply with annual, average carbon-intensity levels for the total amount of fuel they provide in California. The allowable carbon intensity of transportation fuels decreases each year, starting in 2011, until the carbon intensities of gasoline and diesel transportation fuels in 2020 are each reduced by 10 percent relative to 2010. Gasoline and diesel follow similar carbon intensity reduction curves from 2011 through 2020 and beyond. Under the proposal, the carbon intensity for alternative fuels (e.g., biofuels, natural gas, hydrogen, electricity) would be judged against either the gasoline or diesel carbon intensity requirements, depending on whether the alternative fuel is used for light- and medium-duty vehicles or for heavy-duty vehicles, as specified

in the regulation. In each year, the carbon intensity of each fuel is compared to the LCFS requirement for that year. Fuels that have carbon intensity levels below the requirement generate credits. Fuels with carbon intensity levels above the requirement create deficits. To comply with the LCFS for a given year, a regulated party must show that the total amount of credits equals or exceeds the deficits incurred. Excess credits can be retained or sold to other regulated parties.

Progress Reporting and Account Balance Reporting

The proposal provides for regulated parties to submit quarterly progress reports by specified dates. These quarterly progress reports are intended to ensure that regulated parties keep track of their ability to comply with the allowable carbon intensity at the end of the annual compliance period. The quarterly reports are required to contain a specified set of information and data, such as carbon intensities, fuel volumes sold or dispensed, fuel transfer information, and other information.

The annual account-balance reporting includes the information required for the quarterly reporting, along with additional information relating to the total credits and deficits generated during the year or carried over from the previous year; total credits acquired from another party; total credits transferred to other parties; credits generated and banked in the current year; and any deficits to be carried into the next year. All quarterly and annual reporting will be done via a Web-based, interactive form that ARB staff will establish prior to the implementation of the regulation.

Recordkeeping

Regulated parties will be required to maintain specified records in English for a minimum of three years. Upon request by the Executive Officer, regulated parties would need to provide such records within 48 hours or within a mutually agreed upon period of time.

Evidence of Physical Pathway

To ensure that low carbon fuels and blendstocks, produced outside of California, are actually the source of finished fuels used in the State, regulated parties will be required under the proposal to establish physical pathway evidence for transportation fuels subject to the LCFS. For each transportation fuel that a regulated party is responsible for under the LCFS, this could involve a four-part showing:

- A one-time demonstration that there exists a physical pathway by which the transportation fuel is expected to arrive in California. This includes applicable combination of truck delivery routes, rail tanker lines, gas/liquid pipelines, electricity transmission lines, and any other fuel distribution routes that, taken together, accurately account for the fuel's movement from the generator of the fuel, through intermediate entities, to the fuel blender, producer, or importer in California;

- Written evidence, by contract or similar evidence, showing that a specific volume of a particular transportation fuel with known carbon intensity was inserted into the physical pathway as directed by the regulated party;
- Written evidence, by contract or similar evidence, showing that an equal volume of that transportation fuel was removed from the physical pathway by the regulated party for use as a transportation fuel in California; and
- An update to the initial physical pathway demonstration whenever there are modifications to the initially demonstrated pathway.

Provisions Governing Credits and Deficits and Reconciliation of Shortfalls

Detailed equations and calculations are specified in the proposal for a regulated party to use in calculating its total credits and deficits within each compliance period. A regulated party will meet its annual compliance requirements if its credit balance, at the end of the compliance year, is greater than or equal to zero. Conversely, a regulated party is in deficit and may be in violation if its credit balance is less than zero at the end of a compliance year.

As noted, a regulated party whose credit balance is less than zero at the end of a compliance year is in deficit and may be in violation of the LCFS, depending on the magnitude of the shortfall. Shortfalls are categorized into two main categories. First, a regulated party that ends a compliance year with a significant credit balance shortfall, determined on a percentage basis, will be in violation of the LCFS and subject to a notice of violation and penalties commensurate with the size of the violation. In addition, the regulated party under that scenario must reconcile and remedy the shortfall within a specified period of time. By contrast, a regulated party that ends a compliance year with a relatively small shortfall (e.g., shortfall is 10% or less) will be required to reconcile the shortfall within the following year, as well as meet the compliance obligations that apply in that year.

It should be noted that, under the proposal, two or more consecutive years in a shortfall will be treated the same as a substantial credit balance shortfall, irrespective of the shortfall's size.

A regulated party may generate credits on a quarterly basis and unused credits may be banked without expiration. A non-regulated third party is prohibited from buying, selling, or trading LCFS credits unless that third party is acting on behalf of a regulated party. There is no prohibition against retiring or exporting LCFS credits to other GHG reduction initiatives, but importing credits from such external programs into the LCFS program would not be allowed.

Determination of Carbon Intensity Values

The carbon intensity values represent the currency upon which the LCFS is based. The carbon intensity is determined in two parts. The first part represents all of the direct emissions associated with producing, transporting, and using the fuel. This involves

determining the amount of GHG emissions emitted per unit of energy for each of the steps in the fuel pathway. The second part considers other effects, including those caused by changes in land use. For some crop-based biofuels, staff has identified land use changes as a significant source of additional GHG emissions. Therefore, staff is proposing that emissions associated with land use changes be included in the carbon intensity values assigned to those fuels in the proposed regulation. No other significant effects that result in large GHG emissions have been identified that would substantially affect the LCFS framework for reducing the carbon intensity of transportation fuels.

To assess the direct emissions, staff used a modified version of the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model. Argonne National Laboratories developed the original GREET model. The modified model, referred to as CA-GREET, was developed under contract with the California Energy Commission. Staff used the CA-GREET model as the primary method for calculating carbon intensity values for various transportation fuels.

CA-GREET is essentially a very large spreadsheet that incorporates many specific numeric values that allow for the calculation of the life cycle GHG emissions associated with producing, transporting, and using various fuels. Staff used CA-GREET to develop specific carbon intensities for a number of different pathways. For some fuels, multiple pathways were developed that represent differences in how and where the fuel is produced.

To assess the emissions from land use changes, staff used the Global Trade Analysis Project (GTAP) to estimate the GHG emissions impact. The GTAP model is discussed in the Staff Report and related Appendices. In general, the model evaluates the worldwide land use conversion associated with the production of crops for fuel production. Different types of land use have different rates of storing carbon. In general, multiplying the changes in land use times an emission factor per land conversion type results in an estimate of the GHG emissions impacts of land conversions.

The proposed regulation has several different methods for establishing carbon intensities. The first method, referred to as Method 1, establishes values in a Lookup Table for a number of specified fuel pathways. Regulated parties may choose to use these pathways to calculate credits and deficits. The staff is proposing that the Board approve this Lookup Table. The proposed regulation establishes that the Executive Officer may approve subsequent amendments to the Lookup Table after a specified public process.

Under specified conditions, regulated parties may also obtain Executive Officer approval to either modify the CA-GREET model inputs to reflect their specific processes (Method 2A) or to generate an additional pathway using CA-GREET (Method 2B). For both Method 2A and 2B, there is a scientific defensibility requirement for the regulated party to meet before the Executive Officer can approve new values. For Method 2A,

there is an additional provision that requires a substantial change in the carbon intensity relative to the analogous value calculated for that pathway under Method 1.

For CARBOB, gasoline, and diesel fuel, there are specific provisions with regard to the method for determining carbon intensity values, depending on whether the crude oil used to make such fuels is derived from crude oils with high carbon intensity relative to the average carbon intensity of crude oils used in California refineries. Examples include certain crude oils produced from oil sands, oil shale, or other high carbon-intensity crude oils. With regard to CARBOB, gasoline, and diesel fuel made from crude oil extracted from any source other than these high carbon-intensity crude oils, the regulated party would be required to use the carbon intensity specified in the Lookup Table for that fuel.

By contrast, for CARBOB, gasoline, and diesel fuel made from high carbon-intensity crude oil, the regulated party would be required to use the carbon intensity value, if any, which is specified in the Lookup Table for that particular pathway. If there is no carbon intensity value specified for a particular high carbon-intensity crude oil, the regulated party could use Method 2B (with Executive Officer approval) to generate an additional pathway for this type of crude. Alternately, the regulated party could use the standard Lookup Table value, but only if the regulated party can demonstrate to the Executive Officer that its crude production and transport carbon-intensity value has been reduced to a specified level.

The proposed uses of Method 2A and 2B are subject to public review under the proposal. In other words, the Executive Officer may not approve a carbon intensity value proposed pursuant to Method 2A or 2B unless the proposed method and associated information submitted in support of that method has been disclosed to the public and available for public review for the prescribed time period. Trade secrets, as defined under State law, that are submitted would be treated in accordance with established ARB regulations and procedures (California Code of Regulations, title 17, sections 91000-91022) and the Public Records Act (Government Code § 6250 et seq.).

Executive Officer Review and Multimedia Evaluations

The proposal would require the Executive Officer to conduct a review of the LCFS implementation by January 1, 2012, the scope and content of which would be determined by the Executive Officer. In addition, staff expects to periodically review the LCFS, likely on a three year schedule. Therefore, the next review would be conducted by January 1, 2015.

Pursuant to Health and Safety Code section 43830.8(a), the Board may not adopt a regulation that establishes a specification for a motor vehicle fuel unless a multimedia evaluation for the regulation undergoes the review process specified in the statute. However, this multimedia requirement does not apply if the regulation does not establish a motor-vehicle fuel specification. Based on its assessment as discussed in the Staff Report, staff has determined that the proposed LCFS regulation, by itself, does not establish a motor-vehicle fuel specification and therefore does not trigger a multimedia evaluation requirement under Health and Safety Code section 43830.8(i).

While the proposal, by itself, does not establish motor-vehicle fuel specifications, we expect that as new, lower-carbon intensity fuels are developed over time, ARB may need to establish fuel specifications to allow the sale of such fuels in California. In those cases, we anticipate the need to conduct multimedia evaluations for the specific fuels. Indeed, ARB has a multimedia evaluation already underway for biodiesel and renewable diesel, for which we hope to establish new fuel specifications in a future rulemaking. Similar multimedia evaluations may be needed if ARB amends the specifications for 85% ethanol gasoline (E-85) and adopts a new biobutanol fuel specification. Therefore, the proposal contains provisions relating to multimedia evaluations which, when applicable, would be conducted pursuant to Health and Safety Code section 43830.8.

Finally, the Staff Report includes a quantitative evaluation of GHG emissions generated during the production of biofuels by including both direct and indirect land use impacts in the carbon intensity values. Other issues with regard to the sustainability of alternative fuels will be evaluated by the staff and addressed in the next few years. This will require coordinating with other organizations on a national and international basis.

Environmental and Economic Impacts:

The following discussion summarizes the staff's analyses of the environmental and economic impacts of the LCSF. A more detailed discussion of these impacts can be found in the Staff Report.

Environmental Impacts

The proposed regulation is expected to significantly reduce emissions of greenhouse gases, such as CO_2, methane, nitrous oxide, and other GHG contributors from the use of transportation fuels subject to the LCFS. By 2020, the LCFS is expected to reduce the average carbon intensity of transportation fuels by about 10 percent relative to 2010. The LCFS is expected to reduce GHG emissions by about 15 million metric tons of carbon dioxide per year (15 MMT CO_2E) in the year 2020. To meet long term goals for GHG reductions identified in the Scoping Plan, staff intends to propose further strengthening of the rule in the future to require more than 10% reduction after 2020.

From an air quality perspective, staff identified criteria and toxic air pollutants from the different types of activities and operations that could be used to meet the requirements

to the extent that data were available. This includes emissions from feedstock production, transportation, and distribution, fuel production, fuel transportation and distribution, as well as other miscellaneous activities. The analysis focused on regional and localized impacts in California.

Staff anticipates an increase in the number of ethanol, biodiesel, and renewable hydrocarbon production facilities (collectively "biorefineries") that would be needed to provide the fuels necessary to meet the LCFS requirements. Based on an assessment of availability, there may be sufficient volumes of feedstock in California to support approximately 25 additional biorefineries in California. The actual number and siting of these facilities is dependent upon many factors, including the location of the feedstock and the need to sufficiently mitigate environmental impacts pursuant to the California Environmental Quality Act (CEQA, Public Resources Code § 21000 et seq.) and obtaining necessary permits. These include permits from local air pollution control and air quality management districts (local districts). Depending on the specific local district, permitting rules will likely require best available control technology and offsets for criteria pollutants, and an analysis of the localized toxic air pollutant impacts. These determinations will be made on a case-by-case basis with facility specific information.

Advanced biorefineries are generally in development and data are limited. However, staff has conducted and presented in the Staff Report an analysis of the criteria and toxic air pollutant emissions from several types of new biorefineries as part of the overall air quality analysis. The analysis presents both regional and localized emissions impacts. In addition, a cumulative impacts analysis was done on the siting of multiple facilities within a given area. In general, any direct emissions from biorefineries are likely to be mitigated as part of the CEQA process and local air district permitting actions. Therefore, staff expects no significant impact from these facilities on a regional basis. While some increases in localized emissions could occur, staff's analysis has not identified any significant criteria or toxic air pollutant impacts from biorefineries that would not be mitigated through local actions.

Staff also assessed potential other environmental impacts that might result from the implementation of the LCFS. Staff analyzed potential impacts on water quality and water use, agricultural resources, biological resources, hazardous waste and hazardous materials, solid waste, and transportation and other traffic, among others. Some biorefineries could use significant amounts of water which could result in significant impacts. As mentioned above, all new facilities would need to meet CEQA and agency permitting requirements, including requirements of the California Regional Water Quality Control Boards. Therefore, the final determination of impacts on water would need to be made on a site specific basis.

The LCFS will provide some additional incentives to use grid-powered batteries in plug-in hybrid vehicles and battery electric vehicles. However, this increase is not expected to have a significant adverse environmental impact on landfills because the disposal of such batteries is already subject to extensive regulation in the State, and automotive batteries are among the most highly recycled products today. Staff has not identified

any other significant impact that would not otherwise be mitigated through agency permitting or CEQA compliance.

Economic Impacts

As discussed above, the proposal does not specify which combination of transportation fuels the regulated parties must provide to comply with the requirements, and it does not limit the carbon intensity of any particular fuel. However, to meet the LCFS, the fuel mix will need to include alternative fuels that have lower carbon intensities than traditional fuels.

For the economic analysis of the LCFS, staff estimated the costs of producing the petroleum-based fuels—gasoline and diesel—and the costs of producing the lower carbon intensity transportation fuels that could be used in combination with petroleum fuels to meet the LCFS. The costs for the lower carbon intensity fuels include the capital costs for building new fuel production facilities, the operating costs associated with the facilities, and the distribution costs of the products. As discussed above, staff has identified that approximately 25 new biorefineries could be built in California based on an assessment of potential feedstocks. Therefore, staff has also provided cost estimates for the construction and maintenance of these facilities to the extent allowed by available data. In addition to liquid fuels, such as ethanol and biodiesel, staff assessed other lower carbon-intensity fuels, including electricity, hydrogen, and compressed natural gas (CNG).

Once staff estimated the overall production and distribution costs of the lower carbon intensity fuels, staff applied them to the possible compliance scenarios evaluated for both diesel fuel and gasoline. Each of these possible scenarios includes an assumed mix of fuels that satisfies the LCFS reduction targets for the overall fuel mix. The Staff Report discusses these possible scenarios in more detail.

Staff then evaluated the savings that would occur in each scenario due to the avoided cost of buying the traditional fuels that were displaced by the lower carbon-intensity transportation fuels. Next, for each of the possible compliance scenarios, staff estimated the net costs and savings. These, in turn, were used to calculate the regulation's cost-effectiveness, which is defined as net LCFS regulation costs (or savings), in dollars, divided by the carbon dioxide equivalent emissions reduced, in metric tons. Staff also estimated the fuel procurement costs or savings incurred by fuel providers to comply with the LCFS and how these costs or savings might be reflected in fuel prices. Using this information, staff then identified how these changes might affect businesses, consumers, and government agencies.

Staff estimates that the displacement of petroleum-based fuels with lower-carbon-intensity fuels will result in an overall savings in the State. These savings may be realized by the biofuel producers as profit, or some of the savings may be passed on to the consumers. Staff understands that the economic analysis of the LCFS is greatly affected by future oil prices and the actual production costs and timing of lower-carbon intensity alternative fuels. Economic factors, such as tight supplies of lower-carbon

intensity fuels or a lengthy economic downturn keeping crude demand and hence prices down, could result in overall net costs, not savings, for the LCFS.

The combination of the federal RFS and the proposed LCFS regulation will result in a shift of capital from the petroleum sector to the agricultural, chemical, and electricity sectors. This redistribution of capital among these sectors is essential to the success of the LCFS and RFS. The diversification of California's transportation fuels, which requires a shift of capital from the petroleum sector, is consistent with well-established national and State policies.

Additional information on economic impacts is addressed in the economic impacts chapter of the Staff Report.

Peer Review:

Concurrent with this notice, staff will forward the Staff Report to the University of California for peer review pursuant to Health and Safety Code section 57004.

COMPARABLE FEDERAL REGULATIONS

There are no current federal regulations that are comparable to the proposed regulation. The U.S. Environmental Protection Agency (U.S. EPA) has adopted its Renewable Fuel Standard (RFS2) regulation – Code of Federal Regulations (CFR), title 40, part 80, section 1100 et seq. – that mandates the blending of specific volumes of renewable fuels into gasoline and diesel sold in the U.S. to achieve a specified ratio for each year (i.e., the renewable fuel standard). As defined, "renewable fuels" under the RFS superficially resembles the list of transportation fuels subject to the LCFS.[2] However, there are a number of reasons why the RFS is not comparable to the LCFS.

Congress adopted a renewable fuels standard in 2005 and strengthened it in December 2007 as part of the Energy Independence and Security Act (EISA). The RFS2 requires that 36 billion gallons of biofuels be sold annually by 2022, of which 21 billion gallons must be "advanced" biofuels and the other 15 billion gallons can be corn ethanol. The advanced biofuels are required to achieve at least 50% reduction from baseline lifecycle GHG emissions, with a subcategory required to meet a 60% reduction target. These reduction targets are based on lifecycle emissions, including emissions from land use changes.

[2] 40 CFR §80.1101(d)(1) and (2) provides: (1) Renewable fuel is any motor vehicle fuel that is used to replace or reduce the quantity of fossil fuel present in a fuel mixture used to fuel a motor vehicle, and is produced from any of the following: (i) Grain; (ii) Starch; (iii) Oilseeds; (iv) Vegetable, animal, or fish materials including fats, greases, and oils; (v) Sugarcane; (vi) Sugar beets; (vii) Sugar components; (viii) Tobacco; (ix) Potatoes; (x) Other biomass; (xi) Natural gas produced from a biogas source, including a landfill, sewage waste treatment plant, feedlot, or other place where there is decaying organic material.

(2) The term "Renewable fuel" includes cellulosic biomass ethanol, waste derived ethanol, biodiesel (mono-alkyl ester), non-ester renewable diesel, and blending components derived from renewable fuel.

Although the RFS2 is a step in the right direction, the RFS2 volumetric mandate alone will not achieve the objectives of the LCFS. The RFS2 targets only biofuels and not other alternatives; therefore, the potential value of electricity, hydrogen, and natural gas are not considered in an overall program to reduce the carbon intensity of transportation fuels. In addition, the targets of 50% and 60% GHG reductions only establish the minimum requirements for biofuels. It forces biofuels into a small number of fixed categories and thereby stifles innovation. Finally, it exempts existing and planned corn ethanol production plants from the GHG requirements, thus providing no incentive for reducing the carbon intensity from these fuels.

By contrast, the LCFS regulates all transportation fuels, including biofuels and non-biofuels, with a few narrow and specific exceptions. Thus, non-biofuels such as compressed natural gas, electricity, and hydrogen play important roles in the LCFS program. In addition, the LCFS encourages much greater innovation than the federal program by providing important incentives to continuously improve the carbon intensity of biofuels and to deploy other fuels with very low carbon intensities.

If California were to rely solely on the RFS2 (i.e., the "No LCFS" alternative), the State would not achieve the GHG emission reductions called for in AB 32 and Executive Order S-01-07. As noted in the Staff Report, RFS2, by itself, achieves only approximately 30% of the GHG reductions projected under the LCFS program.

Because of these differences, the federal RFS regulation is complementary but not comparable to the staff's proposal.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the potential environmental and economic impacts of the proposal. The ISOR is entitled, "Staff Report: Initial Statement of Reasons for the Proposed Regulation to Implement the Low Carbon Fuel Standard."

Copies of the Staff Report with the full text of the proposed regulatory language may be accessed on the ARB's web site listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing on April 23, 2009.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the ARB's Web site listed below.

Inquiries concerning the substance of the proposed regulations may be directed to the designated agency contact persons, John Courtis, Manager of the Alternative Fuels Section, at (916) 323-2661, or Manisha Singh, Air Resources Engineer, at (916) 323-0014.

Further, the agency representative and designated back-up contact persons to whom nonsubstantive inquiries concerning the proposed administrative action may be directed are Lori Andreoni, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-4011, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the Staff Report, including the proposed regulation, and all subsequent regulatory documents, including the FSOR, are available on the ARB Web site for this rulemaking at http://www.arb.ca.gov/regact/2009/lcfs09/lcfs09.htm.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Costs to Local and State Government Agencies

Pursuant to Government Code section 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that, except as discussed below, the proposed regulatory action would not create costs or savings to any State agency or in federal funding to the State, costs or mandate to any local agency or school district whether or not reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

The Executive Officer has determined that the proposed regulatory action would create costs to a State agency in the form of costs to ARB to implement and enforce the regulation and to contract with third parties to certify particular aspects of a regulated party's claimed fuel pathways. Staff estimates that the total costs to the ARB for implementation and enforcement of the regulation, including contract costs to ARB for certification and enforcement, would be approximately $5 million (2009 dollars) for the period from 2010 through 2020. Annual costs are expected to be about $0.5 million per year. These annual costs are necessary to enforce the proposed regulation on an ongoing basis. This includes field inspections, reviewing records and reporting, and tracking regulated party compliance with the annual requirements. As mentioned earlier, ARB is considering a fee program that would pay for the costs to implement certain provisions of the proposed regulation related to the review and approval of alternative carbon intensity values for low carbon fuels.

The Executive Officer has determined that the proposed regulatory action would create costs to the State in the form of lost transportation-fuel taxes. The State excise tax for E85 is nine cents per gallon instead of 18 cents per gallon for gasoline. Furthermore, staff expects the E85 price to be less than the gasoline price, which affects sales tax. Staff estimates these costs to be $80 million to $360 million in 2020. Note that these estimates are dependent on the compliance path(s) chosen.

Impacts to local sales taxes would be location specific. Staff estimates that the impacts on local sales tax could range from a $45 million loss in revenue to a $2 million gain in revenue. Again, these estimates are dependent on the compliance path(s) chosen.

Costs to Businesses and Private Individuals

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses.

Representative businesses subject to the LCFS include large petroleum refiners, biofuel producers, utility companies, and energy service providers.

The Executive Officer has determined that the capital costs for a typical business subject to the LCFS range from $0 to $3 million. On average, we estimate the added annual costs for a typical business would be less than $1 million per company. For all businesses subject to the LCFS, we estimate added annual costs to range from about $5 million in 2010 (when implementation begins) to $7 million in 2020 (the final year for the cost analysis).

Staff estimates that the proposal will result in overall savings in the State. These savings may be realized by the biofuel producers as profit, or some of the savings may be passed on to the consumers. Should the savings be entirely passed on to consumers, it would represent less than three percent of the total cost of a typical gallon of transportation fuel.

Furthermore, staff recognizes that the combination of the federal RFS and the proposed LCFS regulation will result in a shift of capital from the petroleum sector to the agricultural, chemical, and electricity sectors. Staff expects California's refineries to continue operating at capacity. The displaced petroleum products will be imported fuel blendstocks.

The Executive Officer has determined that, because the proposed regulation will result in overall savings in the State, there would be no significant impacts on businesses subject to the LCFS, California competitiveness of these businesses, or on individuals purchasing such transportation fuels subject to the LCFS, even if all these costs were passed on to the consumer. Biofuel producers are expected to eventually recoup their costs through the sale of low carbon intensity fuels, while consumers should see no significant changes in fuel prices to some savings.

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

Except as noted below, in accordance with Government Code section 11346.3, the Executive Officer has determined that the proposed regulatory action may create some new businesses and jobs, although it would not significantly affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. The Executive Officer has determined that there is a possibility the proposed regulatory action will result in a positive impact on business creation due to construction and operation of new biorefineries and development of low-carbon alternative fuel infrastructure. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

The Executive Officer has also determined that, pursuant to California Code of Regulations, title 1, section 4, the proposed regulatory action would affect small businesses.

In accordance with Government Code section 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the regulations that apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

In accordance with Health and Safety Code sections 43013(a) and (b), the Executive Officer has determined that the standards and other requirements in the proposed regulation are necessary, cost-effective, and technologically feasible for producers, importers, blenders, refiners, and other regulated parties subject to the LCFS. The reporting requirements are necessary for the enforcement of the regulation. Without effective enforcement, we cannot achieve the GHG emission reductions and public health benefits associated with the proposed regulation.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by e-mail before the hearing. To be considered by the Board, written submissions must be received **no later than 12:00 noon, Pacific Standard Time, April 22, 2008**, and addressed to the following:

- Postal mail: Clerk of the Board, Air Resources Board
  1001 I Street, Sacramento, California 95814
- Electronic submittal : http://www.arb.ca.gov/lispub/comm/bclist.php
- Facsimile submittal: (916) 322-3928

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., you address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and other search engines.

The Board requests but does not require 30 copies of any written submission. The Board also requests that written, facsimile, and e-mail statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted to ARB in sections 38510, 38560, 38560.5, 38571, 38580, 39600, 39601, 41510, 41511, 43013, and 43018, Health and Safety Code; and *Western Oil and Gas Ass'n v. Orange County Air Pollution Control District*, 14 Cal.3rd 411, 121 Cal.Rptr. 249 (1975). This regulatory action is proposed to implement, interpret, or make specific sections 38501, 38510, 38560, 38560.5, 38571, 38580, 39000, 39001, 39002, 39003, 39515, 39516, 41510, 41511, 43013, and 43018, Health and Safety Code; and *Western Oil and Gas Ass'n v. Orange County Air Pollution Control District*, 14 Cal.3rd 411, 121 Cal.Rptr. 249 (1975).

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the ARB may adopt the regulatory language as originally proposed or with non-substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the

proposed regulatory action. In the event that such modifications are made, the full regulatory text, with the modifications clearly indicated, will be made available to the public for written comment at least 15 days before it is adopted. Modifications that may be made include, but are not limited to:

(1) Inclusion of language that would enumerate specific acts prohibited under the regulation, and inclusion of a method to convert a violation of the regulation into the number of days in violation, where appropriate, as provided in section 38580(b)(3) of the Health and Safety Code.

(2) Inclusion of a schedule of fees, to be paid by the regulated parties, to fund the use of third-party services. These third-party services would be used to substantiate fuel pathways and other information submitted to the Executive Officer under the LCFS. The tracking of credit trades and acquisitions may also be funded by these fees.

(3) Inclusion of provisions that would further discourage major shortfalls. Possible approaches include requiring regulated parties with a major shortfall in credits (i.e., greater than a specified level as set forth in the proposal) to reconcile, in the following compliance year, an amount of tons of CO_2E equal to the amount of the shortfall times a specified multiplier. The multiplier may be established so that it is proportional to the magnitude of the shortfall.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

/s/

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James N. Goldstene
Executive Officer

Date: February 24, 2009

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web site at www.arb.ca.gov.