TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER A LOW CARBON FUEL STANDARD

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider re-adoption of an updated 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: February 19, 2015

TIME: 9:00 a.m.

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

This item may be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., February 19, 2015, and may continue at 8:30 a.m., on February 20, 2015. This item may not be considered until February 20, 2015. Please consult the agenda for the meeting, which will be available at least 10 days before February 19, 2015, to determine the day on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW PURSUANT TO GOVERNMENT CODE 11346.5(a)(3)

Sections Affected: Proposed repeal of California Code of Regulations (CCR), title 17, existing sections 95480, 95480.1, 95481, 95482, 95483, 95484, 95485, 95486, 95487, 95488, 95489, and 95490, and proposed adoption of CCR, title 17, sections 95480, 95481, 95482, 95483, 95483.1, 95483.2, 95484, 95485, 95486, 95487, 95488, 95489, 95490, 95491, 95492, 95493, 95494, 95495, 95496, and 95497.

Documents Incorporated by Reference:

The following models would be incorporated in the regulation by reference as specified by section:

1. "Agro-Ecological Zone Emissions Factor (AEZ-EF)" model (February 21, 2014), section 95481(a)(2);

2. ASTM D6751-14 (2014), *Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels*, sections 95481(a)(6), 95481(a)(8)(C);

3. ASTM D7467-13 (2013), *Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)*, section 95481(a)(9);

4. ASTM D975-14a, (2014), *Standard Specification for Diesel Fuel Oils*, sections 95481(a)(15) and 95481(a)(28);

5. ASTM D4806-14 (2014), *Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel*, section 95481(a)(28);

6. "Global Trade Analysis Project (GTAP) Model" (December 2014), section 95481(a)(42);

7. Oil Production Greenhouse Gas Emissions Estimator (OPGEE) model, Version 1.1 Draft D (October 1, 2014), section 95481(a)(63);

8. California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation model, Version 2.0-T1 (CA-GREET 2.0-T1) (December 15, 2014), section 95488(c)(4)(F)1;

9. California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation model, Version 2.0-T2 (CA-GREET2.0-T2) (December 15, 2014), section 95488(c)(4)(F)1;

10. "Industrial Strategies Division, Air Resources Board (December 15, 2014), Low Carbon Fuel Standard (LCFS) Pathway for the Production of Biomethane from the Mesophilic Anaerobic Digestion of Wastewater Sludge at a Publicly-Owned Treatment Works (POTW), version 2.0," section 95488(c)(4)(F);

11. "Industrial Strategies Division, Air Resources Board (December 15, 2014), Low Carbon Fuel Standard (LCFS) Pathway for the Production of Biomethane from High Solids Anaerobic Digestion (HSAD) of Organic (Food and Green) Wastes, version 2.0," section 95488(c)(4)(F);

12. "Industrial Strategies Division, Air Resources Board (December 15, 2014), Detailed California-Modified GREET Pathway for Ultra Low Sulfur Diesel (ULSD) from Average Crude Refined in California, version 3,"section 95488(c)(4)(F);

13. "Industrial Strategies Division, Air Resources Board (December 15, 2014), Detailed CA-GREET Pathway for California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB) from Average Crude Refined in California, version 3," section 95488(c)(4)(F);

14. "Industrial Strategies Division, Air Resources Board (December 15, 2014), Detailed California-Modified GREET Pathway for California Average and Marginal Electricity, version 3," section 95488(c)(4)(F);

15. "Industrial Strategies Division, Air Resources Board (December 15, 2014), Detailed California Modified GREET Pathway for Compressed Gaseous Hydrogen from North American Natural Gas, version 3," section 95488(c)(4)(F); and

16. Chapters V, VI, and VII of "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, section 95490(b)(2).

Background and Effect of the Proposed Rulemaking:

In 2006, the Legislature passed and Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (AB 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. 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 required ARB to take actions that included:

- 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 whether an LCFS for transportation fuels used in California could be adopted as a discrete early action measure pursuant to AB 32, and if so 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 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.[1]

[1] 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/>.

In 2007, the Board approved a list of nine discrete early action measures, including 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.

The Board approved an LCFS regulation in 2009. The goal of the LCFS regulation was and is to reduce the carbon intensity of transportation fuels used in California by at least 10 percent by 2020 from a 2010 baseline. ARB approved revisions to the LCFS effective November 26, 2012.[2]

On July 15, 2013, the State of California Court of Appeal (Court) issued its opinion in *POET, LLC v. California Air Resources Board* (2013) 218 Cal.App.4th 681, ruling that the LCFS adopted in 2009 and implemented in 2010 (referred to as 2010 LCFS) would remain in effect and that ARB could continue to implement and enforce the 2013 regulatory standards while taking steps to address California Environmental Quality Act (CEQA) and Administrative Procedure Act (APA) issues identified in the ruling. To address those issues, ARB must set aside the existing LCFS regulation and re-adopt an LCFS regulation.

To comply with the court ruling and to update and revise the LCFS, ARB will bring a new LCFS regulation and the Alternative Diesel Fuel (ADF) regulation to the Board for consideration in 2015. The proposed LCFS regulation will differ from the 2010 LCFS, containing new provisions that among other things are designed to foster investments in the production of the low-CI fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement.

Objectives and Benefits of the Proposed Regulatory Action:

Overview

The proposed regulatory action would reduce the average carbon intensity of transportation fuels used in California by 10 percent by the year 2020, compared to 2010. 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 "well-to-wheels" for fossil fuels, or "seed or field-to-wheels" for biofuels), divided by the fuel's energy content. Depending on the circumstances, GHG emissions from each step can include carbon dioxide (CO_2), methane, nitrous oxide (N_2O), and other GHGs. Carbon intensity is typically expressed in terms of grams of CO_2 equivalent per megajoule (grams CO_2e/MJ).

The proposed LCFS regulation will achieve a 10 percent reduction in average carbon intensity by requiring specified providers of transportation fuels used in California (referred to as "regulated parties") to meet an incrementally lower carbon intensity standards in each subsequent year. A regulated party's overall carbon intensity for its

[2] The current and complete regulatory text is available at http://www.arb.ca.gov/fuels/lcfs/CleanFinalRegOrder_112612.pdf.

pool of transportation fuels would then need to meet each year's specified carbon intensity level. Regulated parties can do that with any combination of fuels they produce or supply and LCFS credits banked in previous years or acquired from other regulated parties.

Applicability, Regulated Parties, and Fuels

The proposed 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. But 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 CNG and fossil LNG, respectively), the regulated party for fossil CNG will generally be the 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 utility supplying the electricity to the vehicle or another party that provides 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.

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,
- Fossil compressed natural gas (CNG), fossil liquefied natural gas (LNG), or liquefied compressed natural gas (L-CNG)
- Biogas-derived CNG (bio-CNG), biogas-derived LNG (bio-LNG), or biogas-derived L-CNG (bio-L-CNG)
- 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,
- Denatured fuel 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, bio-CNG, bio-LNG, and bio-L-CNG. 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 megajoules 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 military tactical vehicles, interstate locomotives, aviation, and ocean-going vessels. However, it is important to note that this exemption does not apply to *intra*state locomotives and commercial harbor craft, for which the diesel fuel is already subject to the requirements in 17 CCR § 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 harbor craft subject to 17 CCR § 93117 would be treated the same as any other transportation fuel subject to the LCFS.

Transfer of Compliance Obligations

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 fuel ownership is transferred. There are two major exceptions to this general rule. For CARBOB and diesel fuel, the compliance obligations would generally transfer to another producer or importer, with provisions for the initial regulated party to retain the compliance obligation if so agreed by the affected parties.

Notwithstanding the presumption noted above, 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.

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 2016, 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 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. Supplying fuels that have carbon intensity levels below the requirement generates credits. Supplying fuels with carbon intensity levels above the requirement generates deficits. To comply with the LCFS for a given year, a regulated party must show that the total amount of credits equal or exceed 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. 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 the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS).

Recordkeeping

Regulated parties will be required to maintain specified records in English for a minimum of five years. Upon request by the Executive Officer, regulated parties would need to provide such records within 20 days.

Evidence of Fuel Transport Mode

To ensure that low carbon fuels and blendstocks reported to ARB are actually the source of finished fuels used in the State, regulated parties will be required under the proposal to demonstrate the physical mode by which the fuels are actually delivered. For each transportation fuel that a regulated party reports, the demonstration could involve a four-part showing:

- An initial demonstration of the delivery methods comprising the physical transport mode by which the transportation fuel is expected to arrive in California. This includes applicable combination of truck/rail lines or routes, pipelines, and other delivery segments that, together, comprise the physical transport mode;
- Written evidence that a specific volume of a particular transportation fuel with known carbon intensity was introduced into the physical transport mode as directed by the regulated party;
- Written evidence that the same volume of that transportation fuel was removed from the physical transport mode in California by the regulated party for use as a transportation fuel in California; and
- An update to the initial demonstration whenever there are modifications.

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 presumptively in violation if its credit balance is less than zero at the end of a compliance year.

If a regulated party has not generated, acquired, or carried over sufficient LCFS credits to retire and offset the entire compliance obligation for the given compliance period, it may still be able to attain compliance via a year-end credit clearance market. The regulated party with an unmet compliance obligation will be considered in compliance for that year if (1) a clearance market is held, (2) the party participates by purchasing its pro rata share of credits pledged for sale in the clearance market, and (3) the party retires the unmet compliance obligation, with interest, within five years. If no market is held, the party will be deemed in compliance for the year if it retires any accumulated, unmet compliance obligation, with interest, within five years.

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 except as an agent of a regulated party. There is no prohibition against retiring or exporting LCFS credits to other GHG-reduction programs, 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. First, all of the direct emissions associated with producing, transporting, and using the fuel are determined. Second, indirect effects caused by changes in land use are considered. 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 proposes using a modified version of the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET1 2013) model, developed by Argonne National Laboratories. ARB developed a modified model, referred to as CA-GREET 2.0. CA-GREET 2.0 is essentially a 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.

To assess the emissions from land use changes, staff proposes using a global economic model to estimate the GHG emissions impact. The Global Trade Analysis Project (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 by an emission factor for the land conversion type results in an estimate of the GHG emissions related to land conversions.

The proposed regulation establishes fuel pathways for two categories: Tier 1 includes conventionally-produced, first generation fuels, and Tier 2 includes fuels produced using emerging technologies and/or innovative production methods, such as low-CI sources of process energy. In general, Tier 1 fuels have been in use under the LCFS for three years, whereas Tier 2 fuels have been in full commercial production for a relatively short period of time, and are relatively new to the LCFS. Under Tier 1, applicants calculate their pathway CIs using the custom CI calculator found in the "T1 Calculator" tab of CA-GREET 2.0. This calculator computes pathway CIs using only the base set of input parameters that determine a Tier 1 pathway CI. Tier 2 applicants may obtain a new fuel

pathway using the Tier 2 Lookup Tables for a number of specified fuel pathways. Regulated parties may choose to use these pathways to calculate credits and deficits.

Also under Tier 2, regulated parties may also seek Executive Officer approval to either modify the CA-GREET 2.0 model inputs to reflect their specific processes (Method 2A) or to generate an additional pathway using CA-GREET 2.0 (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 Lookup Table pathway.

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 until after the proposed method and associated information submitted in support of that method have been made available for public review. Trade secrets would be protected under established ARB regulations and procedures.

Executive Officer Review and Multimedia Evaluations

The proposal would require the Executive Officer to conduct a review of the LCFS implementation, including specified topics, solicit public input, and report to the Board by January 1, 2019.

Pursuant to Health and Safety Code (H&S) 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 H&S section 43830.8(i).

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 conducted a multimedia evaluation for biodiesel and renewable diesel, for which new fuel specifications will be presented to the Board in 2015. Similar multimedia evaluations may be needed if ARB amends the specifications for 85 percent ethanol gasoline (E85) and adopts a new biobutanol fuel specification. Therefore, the proposal contains provisions relating to multimedia evaluations which, when applicable, would be conducted pursuant to H&S section 43830.8.

Economic Impacts:

The economic impacts are dependent upon what options the regulated parties choose to use to meet the performance-based LCFS. To demonstrate the feasibility of the

standard itself, staff prepared an illustrative compliance scenario demonstrating that achieving the LCFS is feasible, as discussed within the Staff Report. This scenario identifies the need for additional low-carbon alternative fuels, including biofuels, electricity, hydrogen, and natural gas, both fossil and renewable. The illustrative scenario points to the need for substantial new volumes of low-carbon biofuels. This, in turn, generally points to the need for additional biofuel production facilities to produce the fuel. There is no specific requirement that these facilities be built in California. In addition, to the extent that these fuels could be used to comply with either the LCFS or the federal Renewable Fuels Standard, the impacts would not solely be attributable to the LCFS.

The economic impacts analysis considers the impacts of meeting the LCFS and considers the scenario as a basis for the analysis. The following discussion summarizes the staff's economic analysis.

The LCFS and the ADF regulations will be proposed to the Air Resources Board for consideration in 2015. The goals of the LCFS proposal are to achieve a 10 percent reduction in the carbon intensity of California transportation fuels by 2020, to diversify California's transportation fuel portfolio, and to create a durable regulatory framework that can be adopted by other jurisdictions. The primary goals of the ADF proposal are two-fold: 1) establish a comprehensive, multi-stage process governing the commercialization of ADF formulations in California, and 2) to establish special provisions for biodiesel to permit its use within the commercial fuels market in volumes and blends that will result in no significant adverse impacts on public health or the environment relative to conventional petroleum CARB diesel. Both these regulations affect the types and volumes of transportation fuels demanded in California. Due to the strongly complementary nature of these policies, the economic effects of the two programs are modeled together for the purposes of the economic analysis (referred to as the combined LCFS/ADF proposal).

The economic impacts of the proposed LCFS and ADF on the California economy are negligible, considering the size and diversity of California's economy. ARB estimates the LCFS and ADF proposals would at most have a combined impact of reducing the growth in California's Gross State Product by less than 0.06 percent annually from 2016 through 2020.

The estimated direct cost to regulated parties is highly sensitive to the price of LCFS credits, which turns on the supply and demand for credits in the market and cannot be forecast with certainty, as well as turning on the mitigation pathway chosen by biodiesel producers. From 2012 through 2013, when the LCFS standards for gasoline and diesel were declining, the average credit price reported in the LRT was $57. Based on historic credit prices and the fuel volumes that will be required to meet the increasing stringency of the LCFS proposal, ARB analyzed a hypothetical credit price of $100 for the period 2016 through 2020. This method likely overestimates costs because many lower-CI fuels with embedded credits can be generated and secured at costs lower than the market price for stand-alone credits.

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 H&S section 57004.

DETERMINATION OF INCONSISTENCY AND INCOMPATIBILITY WITH EXISTING STATE REGULATIONS

During the process of developing the proposed regulatory action, ARB has conducted a search of any similar regulations on this topic and has concluded that these regulations are neither inconsistent nor incompatible with existing state regulations.

COMPARABLE FEDERAL REGULATIONS

There are no current federal regulations comparable to the proposed regulation. The U.S. Environmental Protection Agency (U.S. EPA) has adopted its Renewable Fuel Standard (RFS2) regulations, 40 CFR §80.1400 et seq., that mandate 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.[3] 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. 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 those that achieve at least 50 percent reduction from baseline lifecycle GHG emissions, with a subcategory required to meet a 60 percent reduction target. These reduction targets are based on lifecycle emissions, including emissions from land use changes.

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[3] 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.

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 percent and 60 percent GHG reductions only establish minimum requirements for biofuels, without incentivizing continuous improvements. It assigns biofuels into four categories, without incentivizing innovations within any category. Finally, it does not apply to certain corn ethanol production plants, thus providing no incentive for reducing the carbon intensity from their 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 may 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 neither achieve the fuel carbon intensity goals called for in Executive Order S-01-07, nor stimulate the innovation needed to support future dramatic GHG reductions from the transportation sector. As noted in the Staff Report, RFS2 by itself achieves only approximately 30 percent to 40 percent 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

ARB staff has prepared a Staff Report for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Staff Report: Initial Statement of Reasons for Proposed Rulemaking to Readopt a Low Carbon Fuel Standard.

Copies of the ISOR and the full text of the proposed regulatory language may be accessed on 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, First Floor, Sacramento, California, 95814,
(916) 322-2990, beginning on December 30, 2014.

Final Statement of Reasons Availability

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 ARB's web site listed below.

Agency Contact Persons

Inquiries concerning the substance of the proposed regulatory action may be directed to the designated agency contact persons, Jack Kitowski, Assistant Division Chief, Industrial Strategies Division, at (916) 445-6102, or Katrina Sideco, Air Resources Engineer, at (916) 323-1082.

Non-substantive inquiries concerning the proposed administrative action may be directed to Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff 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 Amy Whiting.

Internet Access

This notice, the ISOR and all subsequent regulatory documents, including the FSOR when completed, are available on ARB's website for this rulemaking at www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm

DISCLOSURES REGARDING THE PROPOSED REGULATION

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 regulatory action are presented below.

Fiscal Impact / Local Mandate

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action would not create significant costs or savings to any State agency or affect 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 costs or savings to State or local agencies.

The proposed LCFS regulation poses no mandate on State agencies, local agencies, or school districts. The potential impact of the LCFS may be on fuel prices, which may create a minor ongoing cost to local and state agencies. The standards for 2014 and 2015 under the existing LCFS regulation are frozen at 1.0 percent by a Court order, and because LCFS credit prices are about $25, the impact of the LCFS on fuel prices is currently indiscernible at the pump. At a hypothetical price of $100 per LCFS credit, and a CI-reduction target of two percent in 2016, the estimated maximum cost impact on fuel prices would be 2 cents per gallon. Similarly, for 2017's target of 3.5 percent reduction, the estimated maximum impact would be 3.5 cents per gallon.

These maximum impacts are well within the normal volatility of fuel prices and would essentially be unseen at the pump. Nevertheless, as an illustrative example, if LCFS prices were $100/credit, for a State or local government agency whose combined fleet of vehicles consumes 100,000 gallons of fuel annually, the fiscal impact would be:

FY 14/15: None
FY 15/16: $1,750 (1.75 cpg: 6 months negligible and 6 months @ 3.5 cpg)
FY 16/17: $4,250 (4.25 cpg: 6 months @ 3.5 cpg and 6 months @ 5 cpg)

On the other hand, because of the increase in price of petroleum diesel, gasoline, and their alternatives due to the conservatively assumed full-pass through of the theoretical credit price (in this example, $100), there would be increases in the local revenue collected from sales tax. While the magnitude of the increase depends on the credit price and varies depending upon the tax rate in the locality, ARB estimates a total change of $4 million in 2016 to $15 million in 2020. These results vary greatly depending on the local tax rate, the consumption patterns of consumers in these areas, the realized credit price, and the amount of the credit price that is passed on to consumers.

Similarly, there would be increases in the State revenue collected from sales tax. ARB estimates a total increase in state revenues of $11 million in 2016 and up to about $42 million in 2020. These results vary greatly depending on the realized credit price and the amount of the credit price that is passed on to consumers. Additionally, excise taxes are reduced due to reductions in diesel consumed amounting to a reduction in excise taxes of $7 million in 2016 and $2 million in 2020. Overall, the impact to the State budget, based on the theoretical compliance scenario is an increase of $4 million in 2016 and $40 million in 2020.

Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete

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.

RESULTS OF THE STANDARDIZED REGULATORY IMPACT ANALYSIS/ASSESSMENT PREPARED PURSUANT TO GOV. CODE § 11346.3(c)

In October 2014, ARB submitted a Standardized Regulatory Impact Assessment to DOF for their review. To determine the economic impacts of the regulation, ARB modeled the impact of the combined LCFS/ADF proposals using a hypothetical credit price of $100. The economic impacts have very small but negative impacts on macroeconomic indicators.

Since the submittal, there have been minor changes to the regulation. ARB chose to update the analysis and present them in Appendix F of the ISOR. The results of the

updated macroeconomic modeling are not significantly different from the original SRIA as submitted to DOF. ARB interprets these results as insignificant given the size of California's $2 trillion economy and the uncertainty of the credit prices and fuels that are brought to California for compliance. Private investment growth slows by -0.01% in 2016 and -0.13% in 2020 (-$20 million and -$520 million respectively). Personal income growth slows by -0.01% in 2016 and -0.06% in 2020 (-$120 million and -$1,470 million respectively). Gross State Product growth slows by 0.00% in 2016 and -0.07% in 2020 (-$30 million and -$1,730 million respectively). Employment growth slows by -0.01% in 2016 and -0.08% in 2020 (-2400 and -17,300 respectively).

Effect on Jobs/Businesses:

The proposed LCFS/ADF regulation would slow the growth in employment. To the extent that the Low Carbon Fuels Standard may affect transportation fuel prices, and California business that uses transportation fuels may be affected by the LCFS. The LCFS is a fuel-neutral, performance-based regulation that allows regulated parties to find the most cost-effective approaches to compliance. There are opportunities for producers of lower-CI fuels (e.g., biodiesel, renewable diesel, low-CI ethanol) to construct facilities in California, thereby creating new businesses. On the other hand, if the LCFS reduces petroleum dependence, some petroleum-related businesses may be affected. Due to the flexible, performance-standard nature of the LCFS, precisely quantifying business gains and losses is not possible. On a macroeconomic scale, the estimated impacts on California's economy are negligible. There are opportunities for producers of lower-CI fuels to construct or expand facilities in California, thereby creating new jobs and businesses. On the other hand, if the LCFS reduces petroleum dependence, some jobs related to producing petroleum-based, high-carbon fuels may be eliminated. Jobs in the fuel distribution system are not expected to change, even if there is a change in the products being distributed.

Competitive Advantages/Disadvantages for Current Businesses:

Pursuant to Government Code section 11346.5(a)(8), the Executive Officer has made an initial determination that the proposed regulatory actions covering the affected regulation 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. In accordance with Government Code sections 11346.5(a)(10) and 11346.3(b), the Executive Officer has further determined that the proposed regulatory actions may lead to the elimination of jobs within – as well as outside of – the State of California, and the elimination of existing businesses within – as well as outside – the State of California. However, these impacts are small on a statewide basis.

An assessment of the economic impacts of the proposed regulatory action and its effect on California businesses can be found in the ISOR.

Investment Effects.

Private investment growth slows by -0.01% in 2016 and -0.13% in 2020 (-$20 million and -$520 million respectively). . ARB interprets these results as insignificant given the size of California's $2 trillion economy and the uncertainty of the credit prices and fuels that are brought to California for compliance.

Innovation Effects

By requiring the gradual, incremental replacement of high-carbon transportation fuels with low-carbon alternatives, the regulation will spur innovation, create a more diverse fuel market. Existing fuel producers are incentivized to find innovative ways to reduce the CI of their fuels because this will reduce the cost of complying with the regulation. In addition, the LCFS incentivizes low-CI fuel producers to enter the market and expand their businesses by developing innovative new fuels that will yield credit revenues.

Benefits

The regulation will spur innovation, create a more diverse fuel market, and set the stage for significant greenhouse gas reductions in future years. Fuel diversity will benefit consumers and GHG reductions will benefit public health and the environment.

The LCFS proposal is expected to improve California's air quality. In fact, the LCFS proposal may reduce criteria pollutant emissions from the 2020 projected vehicle fleet, due to reduced use of petroleum-based diesel. The LCFS proposal is anticipated to deliver environmental benefits that include a cumulative estimated reduction in the $PM_{2.5}$ emissions of more than 1200 tons from transportation fuels in California from 2016 through 2020. Premature deaths caused by ultra-fine particles are expected to decrease by 90 in 2020 due to biodiesel and renewable diesel replacing petroleum diesel. These emissions reductions include the reduced tailpipe emissions of $PM_{2.5}$ associated with the replacement of conventional diesel with substitute fuels, net of any increased emissions of $PM_{2.5}$ associated with feedstock and fuel truck trips from additional California biofuel production facilities and transport from out-of-state biorefineries. Any additional NO_X emissions that may result from the increased use of biodiesel blends are mitigated by the Alternative Diesel Fuel regulation.

Implementation of the LCFS proposal will also diversify the transportation fuel portfolio, thereby reducing the economic impact of volatile global oil price changes on gasoline and diesel prices in California.

A summary of these benefits is provided under the Informative Digest of Proposed Action and Policy Statement Overview Pursuant to Government Code 11346.5(a)(3) discussion on page 4 of this notice.

DOF Comments and Responses

ARB summarized the comments received from DOF on November 18, 2014. The original SRIA is located after the comment responses at the end of this Appendix.

1. DOF Comment: Because the proposed LCFS regulations were not attached, DOF was unable to determine whether all the estimated impacts in the SRIA occur as a result of the regulation were addressed.

Regulatory language can now be found in Appendix A of the ISOR. Additional information and analysis of the proposed regulations can be found in the included Initial Statement of Reasons (ISOR) for the Low Carbon Fuel Standard regulation at www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm and the Alternative Diesel Fuel regulation at www.arb.ca.gov/regact/2015/adf2015/adf2015.htm.

2. **DOF Comment: The purchasers and sellers of the LCFS credits should be clearly stated.**

All regulated parties have the ability to participate in the LCFS credit market by buying and selling credits. Fuel suppliers that produce and sell transportation fuels with carbon intensity values (CI) above that year's standard generate deficits and must retire sufficient credits to offset the deficits generated in order to demonstrate compliance; fuel suppliers that produce and sell transportation fuels with carbon intensity values (as adjusted for relative power train efficiencies) below that year's standard generate credits, which they can retire to meet their compliance obligation, bank, and/or sell in the LCFS credit market.

> In general, the LCFS 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 CI of the fuels or blendstocks that they dispense in California. The proposed regulation specifies the criteria under which an entity would be deemed a regulated party for each particular fuel and how the responsibility for complying with the LCFS can be transferred. Table 1 summarizes the regulated parties for each transportation fuel.

The proposed regulation includes an opt-in provision, which explicitly recognizes that certain alternative fuels have full fuel-cycle CIs (as adjusted for relative power train

efficiencies) that inherently meet the proposed compliance standards through 2020. As a result, these fuels may choose an opt-in provision. These fuels are:

- Electricity;
- Hydrogen and hydrogen blends;
- Fossil CNG derived from North American sources;
- Biogas CNG; and
- Biogas LNG.

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, an entity becomes a regulated party under the LCFS regulation and is required to meet the LCFS reporting obligations and requirements.

The illustrative compliance scenario used for the ISOR economic analysis indicates the projected generation of credits and deficits by fuel types as seen in Appendix F in the ISOR.

Table 1 Transportation Fuel Regulated Parties Engaged in Selling and Buying LCFS Credits

Fuel	Description of Regulated Party
Gasoline, diesel, and liquid blendstocks (including oxygenates, biodiesel and renewable diesel)	The regulated party is the producer or importer of the fuel or blendstocks.
Fossil fuel-derived compressed natural gas (fossil CNG)	The regulated party is generally the utility company, energy service provider, or other entity that owns the fuel dispensing equipment.
Fossil fuel-derived liquefied natural gas (fossil LNG)	The regulated party is the entity that owns the fuel when it is transferred to the fuel dispensing equipment in California.
Other gaseous fuels (biogas/biomethane, hydrogen)	The regulated party will generally be the entity that produces the fuel and supplies it for vehicular use.
Electricity	The regulated party will be either the load service entity 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.

3. **DOF Comment: From a modeling standpoint, because there will be offsetting price and quantity impacts, consumer spending variables in REMI would be a more appropriate means of addressing impacts than consumer price variables alone, as was done in the SRIA.**

The offsetting price and quantity impacts are projections of the industry response to the regulation and are used as inputs to the macroeconomic model. DOF suggests that ARB use a different variable to represent the potential change in consumer spending that would result from the combined LCFS/ADF regulations. Using the consumer expenditures category, as suggested by DOF, would be interpreted in the model as a shift in the demand by consumers and thus yield a higher quantity demanded. This would be counter to the expected impact of the LCFS, which should not increase demand for conventional fuels in California. The LCFS acts to reduce the amount of conventional fuels and replace them with lower carbon alternatives. Using the expenditure changes would misrepresent demand impacts and overly complicate the analysis.

Ideally, the analysis would be performed by switching spending from the conventional fuels category to the alternative fuels category, and then using consumer expenditures in the modeling; however, the aggregation of the fuels into the Petroleum and Coal Manufacturing NAICS code makes macroeconomic modeling of the LCFS regulation difficult. Instead, ARB modeled the change using the consumer price variables because they best estimate the flow of investment among consumers and suppliers of various fuels. The "price premium" is offset by the credit purchases by the petroleum industry and credit sales by low-CI fuels and are modeled as production cost changes. This same methodology was used for the SRIA and the updated analysis, the results of which can be found in Appendix F.

4. DOF Comment: The LCFS program relies on the supply of alternative fuels (and therefore the generation of credits). The analysis could be enhanced by discussing the volatility of credit prices, the interaction of credit prices and the incentives for innovation, and the cost impact on businesses and individuals; this discussion should include the cost-containment measure and its effects. The incentives for innovation will also depend on whether demand for less carbon-intensive fuels will be met through new production in California, or whether such fuels would be imported.

Fuel Availability and Credit Price

Just as the number of deficits generated is determined by the quantity and carbon intensity of conventional fuels sold in the California market, the supply of credits is determined by the quantity and carbon intensity of low-CI fuels sold in the California market.

The financial incentives provided by the LCFS credit value is anticipated to stimulate investments in, and production of, very low-CI fuels. The LCFS credit value represents

a source of additional revenues for low-CI fuel producers and distributors, who can sell credits generated by their fuel. The LCFS credit value can offset the higher initial costs of producing low-CI fuels, and is anticipated to be used to reduce the higher initial price of those fuels to enable them to compete with conventional fuels. The value added from the sale of LCFS credits depends on the fuel's carbon intensity, the stringency of the annual standards, the LCFS credit price, and the volume of conventional fuel displaced.

Table 6: Value Added from the Sale of LCFS Credits

Fuel Type	Assumed CI in 2020	Value Added in 2020
Corn Ethanol	67.24	$ 0.18 / gallon
Cellulosic Ethanol	20.00	$ 0.56 / gallon
Waste Grease Biodiesel	14.97	$ 1.09 / gallon
Renewable Diesel	35.00	$ 0.78 / gallon
Renewable CNG	25.00	$ 0.91 / gallon

Because the supply of credits depends on the availability of low-CI fuels, market participants may face uncertainty regarding whether low-CI fuels will be available in sufficient volumes to achieve compliance, particularly in later years when the stringency of the regulation increases. Staff has analyzed the projected availability of low-CI fuel technologies, which is summarized in Chapter II. This analysis indicates that sufficient volumes of low-CI fuels will be available for compliance in all years analyzed. Historical data indicates a strong market response to the regulation stimulating demand for low-CI fuels. A Low Carbon Fuel Standard has been continuously implemented in California since 2010, and regulated parties have generated more credits than needed every year. The accumulation of banked credits has been augmented by a standard that will have been frozen at 1% through 2015. The scenario projects approximately 3.6 million banked credits available at the start of 2016.

Table 7: Deficits and Credits by Year (MMTs of Credits or Deficits)

Fuels	2016	2017	2018	2019	2020
Gasoline	-5.1	-7.3	-9.4	-12.9	-16.2
Ethanol	4.0	4.1	4.4	4.4	4.4
Electricity (LDV and HDV)	0.7	0.8	1.0	1.2	1.4
Renewable Gasoline	0.0	0.0	0.0	0.1	0.2
Hydrogen	0.0	0.0	0.1	0.1	0.1
Diesel	-0.9	-1.6	-2.2	-3.3	-4.4
Biodiesel	1.5	1.8	2.1	1.9	1.9
Renewable Diesel	2.1	2.5	2.6	2.8	3.0
Natural Gas	1.2	1.3	1.7	2.0	2.4

These values are based on a theoretical $100 LCFS credit price. The above values are rounded to the nearest tenth.

Since 2010, the production of low-CI fuels has increased in response to the financial incentives provided by the existing LCFS regulation. Many innovative, low-CI fuel technologies have moved past the demonstration stage, and have overcome techno-economic challenges that have in recent years limited the supplies of innovative, very-

low CI fuels such as cellulosic ethanol, renewable diesel, and renewable natural gas. Staff analysis indicates that the supplies of low-CI fuels in future years (2016 – 2020) will continue to exhibit the existing trend of increasing production. As the scenario shows, existing low-CI fuel technologies are anticipated to continue to play a large role in achieving LCFS compliance. The stringency of the standard in later years demands increasing quantities of very-low CI fuels, and is anticipated to stimulate the increased production of innovative emerging and nascent technologies like renewable diesel, cellulosic ethanol, biomethane, and electric vehicles.

Incentives for Innovation

Staff has identified innovative low-CI fuel technologies that are poised to increase production at the commercial scale. The proposed regulation will increase the incentive to invest in and increase the production of innovative, very low-CI fuels, particularly as the stringency of the program increases in later years. A more stringent standard will likely result in higher credit prices, all else equal. Higher credit prices, particularly if they are sustained, will increase the incentive to innovate and invest because revenues generated by LCFS credits can be used to increase profit margins or to offset up-front capital costs; these additional revenues will attract investments in low-CI fuels.

The LCFS proposal provides opportunities for businesses within and outside of California to generate credits for low-CI transportation fuels. The proposed LCFS stimulates demand for low-CI fuels, which creates incentives to invest in and produce innovative low-CI fuels. Credits have a monetary value when sold in the LCFS credit market and can be generated by producers of low-CI biofuels, biomethane and natural gas providers selling CNG and LNG, fleet operators utilizing opt-in fuels such as electricity, utilities providing electricity for the residential fueling of electric vehicles, and service providers installing and maintaining public electric vehicle charging equipment. Because the LCFS is a fuel-neutral, performance-based standard, it provides equal incentives to businesses, regardless of location, to increase the production of low-CI fuels. It is unclear to what degree the demand for less carbon-intensive fuels will be met through new production in California or elsewhere. The proposed regulation provides the incentive structure to foster the low-CI fuels market; individual business decisions and the economics of producing the low-CI fuels will determine where the resultant increases in supplies comes from.

The proposed LCFS introduces competition into the fuels market. Firms that are early investors in innovative, low-CI fuel technologies may be at a competitive advantage if LCFS-like carbon-intensity standards are adopted by other jurisdictions.

The incentives for innovation will depend on the demand for less-carbon intensive fuels, which increases with the increasing stringency of the compliance curve. If the demand for low-CI fuel is met by new production in California, then the investment in California will likely be higher. However, the SRIA analysis did not rely on explicit assumptions of production location given that imbedded in the model are assumptions of regional purchasing and production which is dependent upon the NAICs code. Given that the REMI model does not accurately distinguish the conventional and

alternative fuels, ARB relies on the imbedded assumptions for aggregation, production location, demand for fuels, prices, and many other factors that are fundamental to the model.

Cost Containment

If low-CI fuel technologies are slower to achieve commercialization than anticipated, or if there is insufficient investment in low-CI technologies, tight supply may cause upward pressure on credit prices from tight credit supply. Because the credit price is highly dependent on the availability and cost of production of low-CI fuels, and because the action of regulated parties will determine the supply of credits, there is uncertainty regarding future supplies of credits. To reduce the risk of a potentially destabilizing price spike, and to reduce price volatility in the LCFS credit market, the proposed regulation includes a cost containment provision that is summarized in Chapter II. The proposed cost containment provision will cap credit prices and provide an upper bound on the potential cost of complying with the regulation. The proposed price cap will also limit the potential for volatility in the LCFS credit market. Based on a review of the literature and input from stakeholders, including during workshops, staff finds that a cost containment provision can reduce the risk of higher than anticipated costs while maintaining the environmental integrity of the program:

- The risk of higher than anticipated prices resulting from tight supply can be reduced by implementing a price cap and by ensuring regulated parties can achieve annual compliance even under conditions of tight supply.

- The environmental integrity of the program can be maintained by ensuring that the use of a cost containment provision does not relax the carbon intensity reductions that will be achieved by the program.

The price cap is proposed to be set at $200 / credit in 2016 and increase at the rate of inflation in subsequent years. Although a price cap that is set too low may limit the profitability of credit generators (i.e. low-CI fuel producers and distributors), staff analysis of the price cap indicates that $200/ton is high enough to provide a sufficient value added to stimulate the investments in and production of low-CI fuels, and sufficiently high to attract these fuels to California if they are produced elsewhere. The proposed price cap at $200 is anticipated to result in multiple, ancillary market benefits, including reduced price uncertainty, and reduced regulatory uncertainty. Reducing both these sources of uncertainty is anticipated to increase the incentives for investment. Potential investors may be hesitant to invest in low-CI fuel production facilities given conditions of undue uncertainty, particularly because production facilities for low-CI fuels are typically capital-intensive projects with relatively long payback periods.

5. **It would greatly enhance transparency of the discussion to report these in terms of units that are more easily comparable, such as price increase per gallon or price decrease by kilowatt-hour. The economic impacts should also be reported in standard units such as constant dollars or numbers of jobs in addition to the percentages cited.**

In the Economic Impacts chapter of the LCFS ISOR, results (outputs) of the macroeconomic modeling are expressed in constant dollars and percentages, and can be seen in Appendix F. Dollar-per-gallon price impacts are also included and displayed for the theoretical $100 credit price used for the macroeconomic results, and in addition shown for a $25 and $57 credit prices to show a range of potential impacts on consumers. See Appendix F of the ISOR for the outputs for the illustrative compliance scenario at the theoretical $100 credit price.

6. **DOF Comment: The analysis could be supplemented by a discussion of the interaction between the LCFS program and the Cap and Trade program. Additionally, discussing the additional incentives for innovation due to the LCFS above and beyond the Cap and Trade program's contribution.**

In the transportation sector, ARB has outlined a complementary, multi-pronged approach to meet the goals of AB 32. Fuel suppliers have a compliance obligation under the Cap-and-Trade program for the GHG emissions that result from the production and use of fuels. This provides an incentive to reduce emissions and sell cleaner fuels in the market. But it does not require cleaner fuels, as fuel suppliers can purchase allowances to cover their emissions if they so choose.

The LCFS requires that fuel providers supply cleaner fuels in California. As the LCFS reduces the carbon intensity of fuels, it changes the composition of the state's transportation fuel mix and dependence on traditional petroleum-based fuels. The LCFS and Cap-and-Trade programs are designed to complement one another. Investments made to comply with one of the programs will result in reduced compliance requirements for the other program. Reductions in the carbon intensity of fuel due to the LCFS reduce compliance obligations under the Cap-and-Trade Program. Similarly, selling cleaner fuels to comply with Cap-and-Trade helps meet the requirements of the LCFS.

7. **DOF Comment: The SRIA could do a better job of laying out how the low carbon fuel standards fit into the larger picture, and how the regulatory impacts may interact with other parts of the overall strategy for addressing carbon emissions.**

See response to question 6. The Economic Impacts Chapter also discusses the effects of other programs such as Advanced Clean Cars and ARB's Pavley Vehicle Standards.

8. **DOF Comment: The discussion of alternatives should be enhanced by including numbers so that readers can directly compare the impacts. Stating that there are lower costs under an alternative is not as useful as reporting on the magnitude of the difference.**

These tables can be found in Appendix F in the ISOR.

9. **DOF Comment: In the first alternative, we also suggest it should be designed so that there is the same carbon intensity standard for all transportation fuels, rather than just exempting diesel. That is, there should have been an offsetting decrease in carbon intensity for gasoline if diesel is exempted. This would raise costs for gasoline, which then could be compared to the avoided costs for diesel.**

DOF suggested that ARB model a scenario, which was proposed to ARB by the California Trucking Association proposes an alternative regulation wherein the 10% reduction in the carbon intensity of the transportation fuels sold in California by 2020 (from a 2010 baseline) is achieved exclusively through a gasoline standard where diesel and diesel substitutes are excluded from any carbon intensity requirements. Staff analyzed this alternative and determined that it cannot achieve the same level of CI reduction as the proposed regulation due to constraints in the available supply of low-CI gasoline alternatives and physical constraints such as the ethanol blendwall as well as limited penetration of electric and hydrogen vehicles and vehicles that can re-fuel with higher ethanol blends. With highly optimistic assumptions regarding the availability of very-low CI ethanol and highly optimistic assumptions regarding the reduction in carbon intensity values, staff analysis indicates that the gas only alternative could deliver a 7.7% reduction in the carbon intensity of the transportation fuels sold in California by 2020, from a 2010 baseline. Therefore it is not technically feasible for the gasoline only alternative to result in a 10 percent reduction in the carbon intensity of transportation fuels.

As it is anticipated to achieve only 7.7% of the goal of the proposed regulation, the gas only alternative not only falls short of providing a feasible pathway to achieve the proposed regulation's carbon intensity reductions, it is likely to deliver reduced benefits at an higher cost, compared with the proposed LCFS regulation.

This alternative has a lower than 10% reduction in the transportation sector CI level, and is cheaper than the LCFS regulation. However, this alternative will likely drive the price of credits higher, yielding a higher cost per MMT of reductions.

10. DOF Comment: Additional clarification of how the ADF costs are calculated and the reaction of businesses due to the NO_x controls required by the regulation.

The $14.5 million value was based on preliminary NO_x control costs originally estimated early in the analysis. The NO_x control costs have been updated and can be found in Chapter 10 of the ADF ISOR, summarized in Table 10.1. The updated economic impacts as identified in the LCFS and ADF ISOR economics chapters were re-evaluated using the REMI model; the inputs to and outputs from the REMI model can be found in in Appendix F in the ISOR.

11. **DOF Comment: Additional clarification of the fiscal costs to the state for implementation of the regulations is needed. In addition, expansion of the discussion on price changes faced by the consumers, and state and local entities.**

The fiscal costs were expanded and explained in both the LCFS and ADF 399 Fiscal Impact Assessments. Impact of the changing fuel volumes and prices on the budget can be found in Chapter 7 of the LCFS ISOR.

12. **DOF Comment: Additional ARB personnel needed for the regulation should be identified.**

The personnel need assessment was identified in the Fiscal Impact Assessment of Form 399.

Cost Impacts on Representative Private Persons or Businesses

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

The potential impact of the LCFS may be on fuel prices, which would be an ongoing cost. Therefore, the potential impact of the LCFS on private persons and businesses depends on how much transportation fuel those persons and businesses use. Businesses such as delivery services and taxis would be more affected than businesses that use much less fuel, although the cost of delivered inventory may be affected. Therefore, the cost impacts to a "typical" business are unquantifiable. Nevertheless, some illustrative examples may be useful.

In 2020, when the maximum cost impact on fuel may be about 13 cents/gallon based on a hypothetical LCFS credit price of $100, the cost impact for a "typical" business that has a vehicle fleet traveling a million miles per year collectively, their costs would be about $5,000 in 2020. Similarly, for an individual traveling 12,000 miles per year at the same fuel economy, the estimated cost would be $65 in 2020. At lower credit prices those costs would be lower in direct proportion.

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.

Benefits of the Proposed Regulation:

The objective of the proposed regulation is to reduce the carbon-intensity of California's transportation fuels by at least 10 percent by 2020 from a 2010 baseline. In meeting this objective, the LCFS is expected to deliver environmental benefits that include a long-term reduction in GHG emissions from the use of transportation fuels in California. ARB also expects a near-term reduction in the greenhouse gas (GHG) emissions from transportation fuels used in California from 2016 through 2020. Implementation of the LCFS proposal will also diversify the transportation fuel portfolio, thereby reducing the economic impact of volatile global oil price changes on gasoline and diesel prices in California.

The LCFS proposal is expected to improve California's air quality. In fact, the LCFS proposal may reduce criteria pollutant emissions from the 2020 projected vehicle fleet, due to reduced use of petroleum-based diesel. The LCFS proposal is anticipated to deliver environmental benefits that include a cumulative estimated reduction in the $PM_{2.5}$ emissions of more than 1200 tons from transportation fuels in California from 2016 through 2020. These emissions reductions include the reduced tailpipe emissions of $PM_{2.5}$ associated with the replacement of conventional diesel with substitute fuels, net of any increased emissions of $PM_{2.5}$ associated with feedstock and fuel truck trips from additional California biofuel production facilities and transport from out-of-state biorefineries. Any additional NO_X emissions that may result from the increased use of biodiesel blends are mitigated by the Alternative Diesel Fuel regulation.

A summary of these benefits is provided under the Informative Digest of Proposed Action and Policy Statement Overview Pursuant to Government Code 11346.5(a)(3) discussion on page 4 of this notice.

Effect on Small Business

Pursuant to Government Code section 11346.5(a)(7)(C), the Executive Officer has made an initial determination that the proposed regulatory action would have a small negative effect on small businesses comparable to other businesses. The proposed LCFS regulation would slow the growth in employment. To the extent that the Low Carbon Fuels Standard may affect transportation fuel prices, and California business that uses transportation fuels may be affected by the LCFS.

The potential impact of the LCFS on small businesses depends on how much transportation fuel those businesses use. Businesses such as delivery services and taxis would be more affected than businesses that use much less fuel, although the cost of delivered inventory may be affected. Therefore, the cost impacts to a "typical" small

business are unquantifiable. Nevertheless, an illustrative example may be useful. If a small business has a vehicle fleet that travels 100,000 miles annually and achieves an average fuel mileage of 25 miles per gallon, that business would consume 4,000 gallons of fuel in a year. In 2020, when the maximum cost impact on fuel may be about 13 cents/gallon, using a hypothetical LCFS credit price of $100, the cost impact would be around $500 for that year. At current average credit prices of $25, the cost impact would be around 3 to 4 cents/ gallon for a total of $125 for the same small business.

Most California biodiesel producers are small businesses. The LCFS proposal may expand the market for some or all alternative diesel fuels, many of which are produced by small businesses in and outside of California; however, in the early years much of the benefit may be offset by the reduction in biodiesel volumes under the combined LCFS/ADF proposal. In addition, small businesses that produce low-CI fuels can opt into the regulation and generate credits for LCFS. The ADF proposal results in an overall expansion in the market for renewable diesel and other ADFs in California, and California businesses may benefit from a greater choice for their transportation fuels as a result of both proposals.

Housing Costs

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

Business Reports

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

Alternatives

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, 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, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

The Executive Officer analyzed two alternatives to the proposed regulation: one less stringent than the LCFS proposal (Alternative 1: Gasoline Only); and one more stringent than the LCFS proposal (Alternative 2: Retain Full Benefits of the Original CI Reduction Curve).

The cost of complying with Alternative 1 is lower than the cost of complying with the LCFS proposal. The costs are lower for the alternative because it exempts diesel and diesel substitute fuels—approximately 20 percent of the transportation fuel market—from any carbon intensity reduction requirements. Excluding diesel and diesel substitutes, however, precludes the alternative from meeting the carbon intensity

reduction goals of the proposed regulation. This alternative also results in increased emissions of greenhouse gas emissions from the transportation sector, and increased emissions of oxides of nitrogen and $PM_{2.5}$ when compared with the proposed regulation in all years analyzed.

Although Alternative 2 satisfies the ten percent CI reduction by 2020 goal of the LCFS proposal, staff rejects Alternative 2 because it is likely to achieve the CI reduction goal at a higher cost than the proposed regulation, increases the likelihood of non-compliance, and reduces regulatory flexibility. Because this alternative is anticipated to increase regulated parties' cumulative compliance obligation, it will increase the demand for LCFS credits. An increased demand for credits will create upward pressure on the price of LCFS credits, compared with the proposed regulation. An increased credit price associated with the original CI curve alternative would increase the cost of compliance for regulated parties, and increase any adverse impacts on small business and California individuals.

Environmental Analysis

ARB, as the lead agency for the proposed regulatory action, has prepared a Draft Environmental Analysis (EA) under its certified regulatory program (California Code of Regulations, title 17, §§ 60000 through 60008) to comply with the California Environmental Quality Act (Pub. Resources Code § 21080.5). The Draft EA covers both the proposed LCFS and Alternative Diesel Fuel (ADF) regulations. Although the policy aspects and requirements of the proposed LCFS and ADF regulations do not directly change the physical environment, there are potential indirect physical changes to the environment that could result from reasonable foreseeable actions undertaken by entities in response to the proposed regulations and the market. These indirect impacts are the focus of the programmatic-level impacts analysis in the Draft EA.

The Draft EA states that implementation of the proposed regulations could result in beneficial impacts to GHGs through substantial reductions in emissions from transportation fuels in California from 2016 through 2020 and beyond, long-term beneficial impacts to air quality through reductions in criteria pollutants, and beneficial impacts to energy demand. The Draft EA also states that the proposed regulations could result in less than significant or no impacts to mineral resources, population and housing, public services, and recreation; and potentially significant and unavoidable adverse impacts to aesthetics, agriculture resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, transportation and traffic, and utilities, and short-term construction-related air quality impacts primarily related to reasonably foreseeable construction projects and minor expansions to existing operations. The Draft EA, included as Appendix D to the Initial Statement of Reasons, is entitled *Draft Environmental Analysis prepared for the Low Carbon Fuel Standard and Alternative Diesel Fuel Regulations*. Written comments on the Draft EA, submitted as described below, will be accepted during a public review period starting on **January 2, 2015,** and ending at **5:00 pm** on **February 17, 2015**.

WRITTEN COMMENT PERIOD AND SUBMITTAL OF COMMENTS

Interested members of the public may present comments orally or in writing at the hearing and may provide comments by postal mail or by electronic submittal before the hearing. The public comment period for this regulatory action will begin on January 2, 2015. To be considered by the Board, written comments not physically submitted at the hearing, must be submitted on or after January 2, 2015, and received **no later than 5:00 pm on February 17, 2015**, and must be 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

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. All written comments, data, factual information, studies, and reports submitted to ARB during the public comment period or at the Board hearing will be included in the rulemaking file for the proposed regulation. Any person who provided ARB with written feedback or other materials prior to the opening of the public comment period must submit the feedback or materials during the public comment period or at the hearing to have them included in the rulemaking file.

ARB requests that written and email statements on this item be filed at least 10 days prior to the hearing when possible so that ARB staff and Board members have additional time to consider each comment. The Board 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.

AUTHORITY AND REFERENCE

This regulatory action is proposed under the authority granted in Health and Safety Code, sections Authority cited: Sections 38510, 38530, 38560, 38560.5, 38571, 38580, 39600, 39601, 41510, 41511, 43000.5, 43013 and 43018 Health and Safety Code; 42 U.S.C. section 7545, and *Western Oil and Gas Ass'n v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). This action is proposed to implement, interpret, and make specific: Sections 38501, 38510, 39515, 39516, 38571, 38580, 39000, 39001, 39002, 39003, 39515, 39516, 41510, 41511 and 43000, Health and Safety Code; Section 25000.5, Public Resources Code; and *Western Oil and Gas Ass'n v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

HEARING PROCEDURES

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

Following the first public hearing, the Board may consider the regulatory language as proposed or provide direction to staff regarding revisions to the proposed regulation. Any modifications to the proposed regulatory language that are sufficiently related to the originally proposed text will be made available to the public for written comment at least 15 days before it is adopted. **Written comments on the Draft Environmental Assessment must be submitted on or before February 17, 2015 to be considered timely filed.** Any decision to adopt the proposed regulation, with or without modifications, will be made at a second hearing later in 2015.

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

SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile 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.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia
- Documentos disponibles en un formato alterno u otro idioma
- Una acomodación razonable relacionados con una incapacidad

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envié un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: December 16, 2014

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 website at www.arb.ca.gov.