

## TITLE 13. CALIFORNIA AIR RESOURCES BOARD

### NOTICE OF PUBLIC HEARING TO CONSIDER THE PROPOSED REGULATION ON THE COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider a proposed regulation governing the commercialization of motor vehicle Alternative Diesel Fuels (ADF). The ADF regulation is intended to provide a pathway for emerging diesel fuel substitutes to enter the commercial market in California, to manage and minimize environmental and public health impacts, and to preserve the emissions benefits derived from the ARB motor vehicle diesel regulations.

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 amendment of California Code of Regulations (CCR), title 13, sections 2290, 2291, and 2293; proposed renumbering of CCR, title 13, existing sections 2293 and 2293.5, and proposed adoption of CCR, title 13, sections 2293, 2293.1, 2293.2, 2293.3, 2293.4, 2293.5, 2293.6, 2293.7, 2293.8, 2293.9, and Appendix A.

Existing sections 2290, 2291, 2292.1, 2292.2, 2292.3, 2292.4, 2292.5, 2292.6, and 2292.7 would be grouped under new subarticle 1 (Specifications for Current Alternative Motor Vehicle Fuels). Existing sections 2293 and 2293.5 would be renumbered to 2294 and 2295, and would be grouped under a new subarticle 3 (Ancillary Provisions).

**Documents Incorporated by Reference:** The following documents, test methods, and model would be incorporated in the regulation by reference as specified in the proposed sections indicated:

1. Chapters 5, 6, and 7 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 2293.2(a)(18);
2. ASTM D613-14, "Standard Test Method for Cetane Number of Diesel Fuel Oil (2010)," section 2293.6(a)(3), 2293.7(a)(1), Appendix 1(a)(2)(C), (D), and (E);
3. ASTM D5186-03, "Standard Test Method for Determination of the Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels and Aviation Turbine Fuels By Supercritical Fluid Chromatography (2009)," Appendix 1(a)(2)(E);
4. ASTM D287-12b, "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method) (2012)," Appendix 1(a)(2)(C), (D), and (E);
5. ASTM D4629-12, "Standard Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection (2012)," Appendix 1(a)(2)(C), (D), and (E);
6. ASTM D5453-93, "Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, and Engine Oil by Ultraviolet Fluorescence (1993)," section 2293.7(a)(1), Appendix 1(a)(2)(C), (D), and (E);
7. ASTM D6890-13be1, "Standard Test Method for Determination of Ignition Delay and Derived Cetane Number (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber (2013)," section 2293.6(a)(3), 2293.7(a)(1), Appendix 1(a)(2)(C), (D), and (E);
8. ASTM D445-14e2, "Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity) (2012)," Appendix 1(a)(2)(C), (D), and (E);
9. ASTM D93-13e1, "Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester (2013)," Appendix 1(a)(2)(C), (D), and (E);
10. ASTM D86-12, "Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure (2012)," Appendix 1(a)(2)(C), (D), and (E);
11. EN 14103:2011, "Fat and oil derivatives. Fatty acid methyl esters (FAME). Determination of ester and linolenic acid methyl ester contents (2011)," Appendix 1(a)(2)(C) and (D);

12. Snedecor and Cochran, "Statistical Methods," (7<sup>th</sup> ed., 1980), p.91, Iowa State University Press, Appendix 1(a)(2)(G);

**Background and Effect of the Proposed Rulemaking:**

The Low Carbon Fuel Standard (LCFS) (Cal. Code Regs., tit. 17, §95480 et seq.) and the federal Renewable Fuels Standard (RFS) (Clean Air Act §211(o), 42 U.S.C. §7545(o)) both incentivize the expansion of the California transportation fuel pool to include more renewable and low carbon replacements for conventional motor vehicle gasoline and diesel. Existing California and federal laws authorize ARB to regulate fuels, including for the purpose of controlling motor vehicle emissions. (Health & Saf. Code §43013, Clean Air Act §211(c)(o) and (t) [42 U.S.C. §7545(c)(o) and (t)].) Furthermore, title 13, California Code of Regulations sections 2281 through 2285, impose fuel quality standards on conventional motor vehicle diesel fuel to limit both sulfur and aromatic hydrocarbon content.

Existing law allows use of alternative diesel fuels in California, such as biodiesel and renewable diesel, and the LCFS, RFS, and other policies and programs will encourage further innovations in fuels. Some of these innovative fuels are already sold commercially and controlled through industry consensus standards that are implemented by the California Department of Food and Agriculture. Such fuels-related industry consensus standards seek mainly to address vehicle performance and fuel production quality issues. By contrast, air quality impacts from alternative diesel fuels are generally addressed by ARB or the U.S. Environmental Protection Agency (EPA).

The current California diesel fuel regulations focus almost entirely on petroleum hydrocarbon-based fuels for compression ignition engines. Because of the focus on petroleum fuels, the existing diesel regulations are ill-suited to providing a market pathway for innovative non-hydrocarbon-based alternative diesel fuels (e.g., biodiesel, dimethyl ether) and for ensuring that the anticipated air quality benefits from ARB's existing specifications for California diesel ("CARB diesel") are preserved.

Therefore, staff is proposing to consolidate existing administrative and legal procedures and requirements for alternative diesel fuels in this new regulation. The proposed regulation will establish clear legal requirements for the introduction and commercial use of ADFs that are developed and introduced into the market in the future. The proposed regulation also includes in-use requirements and fuel specifications for biodiesel as the first commercial alternative diesel fuel under the proposed regulation. The proposed biodiesel provisions are designed to ensure fuel quality, safeguard against potential increases in oxides of nitrogen (NO<sub>x</sub>) emissions, and maintain enforceability of these requirements.

## **Objectives and Benefits of the Proposed Regulation:**

The primary objective of the proposed ADF regulation is to create a streamlined framework that protects California's residents and environment while encouraging innovative ADFs to enter the commercial market as efficiently as possible. The proposal is intended to ensure that the introduction and use of innovative ADFs in California will have no significant adverse impacts on public health or the environment relative to conventional, petroleum-based "CARB diesel."

The proposed ADF regulation establishes a comprehensive, multi-stage process governing the commercialization of new ADFs in California. This process would start with a screening analysis that would allow limited sales of a regulated diesel substitute while it undergoes an initial evaluation; an intermediate stage with expanded sales governed by enhanced monitoring, testing, and a multimedia evaluation; and a final stage with full-scale commercial sales and provisions designed to maintain environmental and public health protections as needed. The main benefit to the State is to provide and maintain safeguards that protect public health and the environment while such new fuels are being tested and used. The proposed regulation also benefits the State by providing a framework and clear rules that, in turn, will encourage the more rapid introduction of innovative fuels with demonstrated public health advantages. Many of the innovative fuels under development have lower emissions of greenhouse gases (GHG) and criteria and toxic air pollutants, and a number of such fuels can also be produced from renewable or waste sources.

The proposal represents the culmination of a major ARB effort to develop a clear pathway for the commercialization of new diesel fuel substitutes. Over the past several years, ARB staff has conducted research and analyses to understand the air quality impacts of biodiesel, renewable diesel, and other diesel fuel substitutes and additives, and this research effort will continue. ARB also sponsored a comprehensive multimedia assessment under Health and Safety Code section 43830.8 for biodiesel and renewable diesel to determine whether these fuels have any significant adverse impacts relative to conventional CARB diesel. Renewable diesel, while an innovative diesel fuel replacement, is not considered an ADF under the regulation because it consists solely of hydrocarbons and is chemically indistinguishable from conventional diesel.

The effort started with the need to characterize and quantify the emissions potential of biodiesel and renewable diesel, the ultimate goal being the establishment of air quality-based fuel specifications for these two diesel substitutes to govern any continued use in California. However, since that effort began, the LCFS, RFS, and other fuels policies and programs came into effect. Those programs encourage fuel producers to innovate, not only with biodiesel and renewable diesel, but also with other lower carbon fuels such as dimethyl ether. Consequently, ARB staff determined that a uniform and comprehensive review and approval program is needed to set clear ground rules for introducing and commercializing diesel fuel substitutes, both current and future ones, while preserving or enhancing the emissions reductions and health benefits that have been achieved through standards developed for CARB diesel.

ARB staff has worked with major stakeholders such as alternative fuel producers; petroleum refiners and marketers; engine manufacturers; and environmental and public health advocates and local air districts to solicit input via meetings and public workshops on this proposal. Staff developed the proposal based on ARB testing and research, and feedback from stakeholders.

### **DETERMINATION OF INCONSISTENCY AND INCOMPATIBILITY WITH EXISTING STATE REGULATIONS**

During the process of developing the proposed regulatory action, ARB staff reviewed other programs related to ADFs and concluded that the proposal is consistent and compatible with existing state regulations. In particular, staff reviewed two existing California programs: the ARB's Low Carbon Fuel Standard and the California Department of Food and Agriculture's (CDFA) fuels program.

The Low Carbon Fuel Standard regulation (17 CCR 95480 et seq.) reduces the average carbon intensity (CI) of California transportation fuels. However, the LCFS does not set fuel specifications or any other requirements on the properties of the regulated fuels, nor does it establish provisions that govern the use and commercialization of transportation fuels. Thus, the proposal would be consistent and compatible with the existing LCFS regulation as well as a proposed new LCFS regulation that is also scheduled for the Board's consideration.

Staff's proposal is also consistent and compatible with the CDFA's fuels program because the fuel specifications in the proposal are air quality-based, which is ARB's responsibility under State law. CDFA currently regulates biodiesel and renewable diesel as part of their authority to adopt consensus standards under the Business and Professions code. Further, the proposal similarly is consistent and compatible with CDFA's developmental fuels variance program, which is intended to generate engine performance and warranty data to inform development of a consensus standard designed to focus on engine performance, while the proposal's screening analysis and multimedia evaluation provisions are intended to characterize environmental and public health impacts to avoid adverse impacts.

### **COMPARABLE FEDERAL REGULATIONS**

There are no federal regulations that are comparable to the proposed regulation or would accomplish the same objectives and benefits. The U.S. EPA implements a registration program for fuels and fuel additives under title 40, Code of Federal Regulations (CFR), part 79. Under that program, proponents of new fuels and fuel additives need to provide to U.S. EPA requested information so that the agency can determine the fuel or additive's "product emissions that may pose an unreasonable risk to public health." In addition, the U.S. EPA implements the Renewable Fuels Standard program (RFS2), 40 CFR part 80.1400 et seq., which mandates fixed volumes of specified biofuels to be blended with the national gasoline and diesel fuel pools. Under this program, mandated annual volumes of biomass-based diesel are specified, including biodiesel and renewable diesel.

There are a number of significant differences between the federal programs and the staff's proposal. First, the federal registration program applies only to gasoline and diesel and their additives. By contrast, the staff's proposal applies to any new alternative diesel fuel, including fuels that bear little or no resemblance to conventional diesel but nevertheless are designed to be used in compression ignition engines. Another significant difference is that the federal program applies only to on-road fuels and additives, while the staff's proposal applies to alternative diesel fuels used in on-road and off-road motor vehicles. For these reasons the federal program under 40 CFR 79 is not comparable to the proposal. Similarly, the proposal presents no conflict or inconsistency with the RFS2 program since the proposal does not restrict the volume sales of biodiesel, other biomass-based ADFs, or any other biofuels subject to RFS2. Instead, the proposal would impose specified pollutant mitigation measures (which does not include sales volume limits) if and when certain specified criteria are met, and staff's analysis projects it is highly unlikely those criteria will be met in the foreseeable future. Further, the proposal is based on California's general police power authority and is consistent with the provisions governing the State's regulation of fuels and fuel additives under section 211 of the Clean Air Act.

### **AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS**

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The ISOR is entitled, "Staff Report: Initial Statement of Reasons for the Proposed Regulation on the Commercialization of New Alternative Diesel Fuels."

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, 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 action may be directed to the designated agency contact persons, Jim Aguila, Manager of the Substance Evaluation Section, at (916) 322-8283, or Alexander "Lex" Mitchell, Manager of the Emerging Technology Section, at (916) 327-1513.

Further, the agency representative to whom nonsubstantive inquiries concerning the proposed administrative action may be directed is Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information that staff relied upon in developing the proposal. This material is available for inspection upon request to the contact persons.

### **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 <http://www.arb.ca.gov/regact/2015/adf2015/adf2015.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 any significant 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. Of the many State and local agencies contacted, only two reported the use of biodiesel blends that would be subject to in-use requirements under the proposed regulation. These agencies could incur some minor costs as a result of these requirements, though these can likely be absorbed in existing budgets.

#### **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.

#### **Cost Impacts on Representative Private Persons or Businesses**

In developing this regulatory proposal, the Executive Officer evaluated the potential economic impacts on representative private persons or businesses. The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

## **STATEMENT OF THE RESULTS OF THE STANDARDIZED REGULATORY IMPACT ANALYSIS**

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

The proposed regulation has been changed since the SRIA was prepared. ARB chose to update the economic analysis in the SRIA and presented the updated analysis 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 percent in 2016 and -0.13 percent in 2020 (-\$20 million and -\$520 million respectively). Personal income growth slows by -0.01 percent in 2016 and -0.06 percent in 2020 (-\$120 million and -\$1,470 million respectively). Gross State Product growth slows by 0.00 percent in 2016 and -0.07 percent in 2020 (-\$30 million and -\$1,730 million respectively). Employment growth slows by -0.01 percent in 2016 and -0.08 percent in 2020 (-2400 and -17,300 respectively).

While both the proposed LCFS and ADF regulations were modeled together, the ADF regulation is driving only a small portion of the results. For example, in 2018 the ADF regulation makes up less than 1 percent of the direct costs attributable to the regulations. Therefore, a relatively small fraction of the impacts identified in the combined economic analysis for the two proposals is attributable to the ADF proposal.

### **Effect on Jobs/Businesses:**

The proposed LCFS and ADF regulations would slow the growth in employment. To the extent that the two proposals may affect transportation fuel prices, and California business that uses transportation fuels may be affected. There are opportunities under the proposed regulations 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 regulations reduce petroleum dependence, some petroleum-related businesses may be affected. 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 proposed regulations reduce 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 percent in 2016 and -0.13 percent 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*

The regulation will spur innovation, create a more diverse fuel market. For additional analysis, please see "SRIA Comments and Responses", under item 2, titled, "Incentives for Innovation".

### *Benefits*

The regulations 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 proposed regulations are expected to improve California's air quality. In fact, the proposals may reduce criteria pollutant emissions from the 2020 projected vehicle fleet, due to reduced use of petroleum-based diesel. The proposals are anticipated to deliver environmental benefits that include a cumulative estimated reduction in the PM<sub>2.5</sub> 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<sub>2.5</sub> associated with the replacement of conventional diesel with substitute fuels, net of any increased emissions of PM<sub>2.5</sub> associated with feedstock and fuel truck trips from additional California biofuel production facilities and transport from out-of-state biorefineries. Any additional NO<sub>x</sub>

emissions that may result from the increased use of biodiesel blends are mitigated by the proposed ADF regulation.

Implementation of the proposals 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.

### **SRIA Comments and Responses**

ARB summarized the comments received on November 18, 2014 from DOF. The original SRIA can be found in 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 both the LCFS and ADF ISOR documents. 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 and the Alternative Diesel Fuel Rulemakings.

- 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
<b>Corn Ethanol</b>	67.24	\$ 0.18 / gallon
<b>Cellulosic Ethanol</b>	20.00	\$ 0.56 / gallon
<b>Waste Grease Biodiesel</b>	14.97	\$ 1.09 / gallon
<b>Renewable Diesel</b>	35.00	\$ 0.78 / gallon
<b>Renewable CNG</b>	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<sub>x</sub> controls required by the regulation.**

The \$14.5 million value was based on preliminary NO<sub>x</sub> control costs originally estimated early in the analysis. The NO<sub>x</sub> 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.

### **Effect on Small Business**

The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action would not have any significant impacts on small businesses because any costs of compliance are minimal and will not affect the retail price of ADFs offered to the public.

### **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(d) 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 analysis of such alternatives can be found in Chapter 7 of the ISOR.

### **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 ADF and proposed Low Carbon Fuel Standard (LCFS) regulations. Although the policy aspects and requirements of the proposed ADF and LCFS 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 this Draft EA.

The Draft EA stated 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 stated 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, air quality, 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, primarily related to the 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 meeting and may provide comments by postal mail or by electronic submittal before the meeting. 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 meeting must be submitted on or after January 2, 2015 and received **no later than 5:00 p.m. 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 39600, 39601, 39667, 43013, 43018, and 43101, 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 39000, 39001, 39002, 39003, 39010, 39500, 39515, 40000, 43000, 43016, 43018, 43026, 43101, 43830.8, and 43865, 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 first of two 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 and 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.

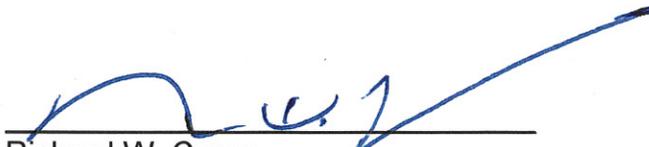
TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades linguisticas 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 envíe 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