State of California
AIR RESOURCES BOARD

**Notice of Public Availability of Modified Text and Availability of Additional Documents and Information**

**PROPOSED RE-ADOPTION OF THE LOW CARBON FUEL STANDARD**

Public Hearing Date: February 19, 2015
Public Availability Date: June 4, 2015
Deadline for Public Comment: June 19, 2015

At its February 19, 2015, public hearing, the Air Resources Board (ARB or Board) considered staff's proposed sections 95480, 95481, 95482, 95483, 95483.1, 95483.2, 95484, 95485, 95486, 95487, 95488, 95489, 95490, 95491, 95492, 95493, 95494, 95495, 95496, and 95497, Title 17, California Code of Regulations (CCR) to reduce the carbon intensity (CI) of transportation fuels used in California by at least 10 percent by the year 2020. In addition to substantially reducing greenhouse gas emissions from transportation fuels, the Low Carbon Fuel Standard (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] The proposed action includes repeal of the existing LCFS regulation (CCR, title 17, sections 95480-95490) in its entirety.

The Board directed the Executive Officer to determine whether additional conforming modifications to the regulation were appropriate and to make any proposed modified regulatory language available for public comment, with any additional supporting documents and information, for a period of at least 15 days in accordance with Government Code section 11346.8. The Board further directed the Executive Officer to consider written comments submitted during the public review period and make any further modifications that are appropriate available for public comment for at least 15 days. The Executive Officer was directed to evaluate all comments received during the public comment periods, including comments raising significant environmental issues, and prepare written responses to such comments as required by ARB's certified regulations at California Code of Regulations, title 17, sections 60000-60007 and Government Code section 11346.9(a). The Executive Officer was further directed to present to the Board, at a subsequently scheduled public hearing, staff's written responses to environmental comments and the final environmental analysis for consideration for approval, along with the finalized regulation for consideration for adoption.

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[1] Governor's White Paper, *The Role of a Low Carbon Fuel Standard in Reducing Greenhouse Gas Emissions and Protecting Our Economy*, http://www.arb.ca.gov/fuels/lcfs/lcfs_wp.pdf.

The resolution and all other regulatory documents for this rulemaking are available online at the following ARB website:

http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm

The text of the modified regulatory language is shown in Attachment A. The originally proposed regulatory language is shown in ~~strikethrough~~ to indicate deletions. In the originally proposed regulatory language, regular text indicates additions for readability. New deletions and additions to the proposed language that are made public with this notice are shown in ~~double strikethrough~~ and double underline format, respectively.

In the Final Statement of Reasons, staff will respond to comments received on the record during the comment periods. The Administrative Procedure Act requires that staff respond to comments received regarding all changes that are noticed. Therefore, staff will address only comments received during this 15-day comment period that are responsive to this notice, documents added to the record, or the changes detailed in Attachment A.

The following summary does not include all modifications to correct typographical or grammatical errors, changes in numbering or formatting, or non-substantive revisions made to improve clarity. For a complete account of all modifications in the proposed regulation, please refer to Attachment A.

**Summary of Proposed Modifications**

1. In section 95481, a number of definitions have been added, deleted, or modified, including but not limited to: a new definition for "Account Administrator"; modified definitions for "Biodiesel," "Biodiesel Blend," "Biogas," "Bio-CNG," "Bio-LNG," "Bio-L-CNG," "Biomass," "Biomethane," "Fuel Pathway Code," "Production facility," "Renewable Hydrocarbon Diesel," and "Transaction Type"; modified definitions to provide updated models or model information for "AEZ-EP Model," "Blendstock" (updating CA-GREET2.0 T-1 and T-2 models), "GTAP" or "GTAP Model," and "OPGEE" or "OPGEE Model"; and deletion of previously proposed definitions for "B100," "Biofuel Production Facility," "LRT-CBTS Reporting Deadlines," and "Multimedia evaluation."
2. In section 95483(a)(2), staff is proposing to remove the requirement that the recipient "producer or importer" of a fuel transfer be required to notify the transferor whether the recipient is a producer or importer for purposes of establishing compliance obligation and regulated party. The recipient "producer or importer" of California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB), Diesel Fuel or Diesel Fuel Blends will no longer automatically become the regulated party as indicated in the previous regulation order. This has been seen as an unnecessary and complicated provision.
3. In section 95483(a)(3), staff is proposing to include gasoline in the subsection.
4. In section 95483(e), staff proposes to define and make clear the primary and alternate parties eligible to generate credits for electricity used as fuel.

5. In section 95483(f), 95486(b)(3)(D), and 95491(a)(3)(E), the original proposal allows regulated parties to generate credits for hydrogen used in on-road vehicles only. An increase in hydrogen fuel cell forklift use coupled with a decrease in internal combustion engine (ICE) forklift is expected to result in decreased GHG emissions and contribute to meeting the goals of the LCFS program. Staff is proposing to make hydrogen fuel cell forklifts eligible to generate credits. Providing another opportunity for credit generation from use of hydrogen as a transportation fuel supports the overall purpose of the LCFS to reduce the carbon intensity of the transportation fuel pool in California, reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low-carbon fuels. The efficiency of hydrogen fuel cell forklifts was analyzed based on a study published by Argonne National Laboratory.[2] The energy economy ratio (EER) was calculated by comparing the power train energy use of liquefied petroleum gas (LPG) ICE forklifts to that of hydrogen fuel cell forklifts. Staff proposes to use the EER value of 2.1 for hydrogen fuel cell forklifts.
6. In sections 95484(b) and (c), as work has progressed since the release of the Initial Statement of Reasons (ISOR) to refine the carbon intensities (CIs) used in the LCFS, three changes have resulted in a recalculation of values that affect the annual LCFS standards for 2016 and beyond.

   The first involves changes in the CI for natural gas used in refineries. This change reduces the CI of CARBOB and diesel by approximately 0.05 $gCO_2e/MJ$. The second change is a correction in the estimate of the CI used for the crude oil that was refined in California in 2010. This change reduces the average CIs of CARBOB and diesel by approximately 0.73 $gCO_2e/MJ$. The third change results from a recalculation of the source of ethanol used in California in 2010. Current information indicates that a 5/95 percent mix of California/Midwest ethanol production was used in 2010. This replaces the 12/88 percent mix assumed in the ISOR. This change increases the average CI of the 2010 California reformulated gasoline (CaRFG) by approximately 0.04 $gCO_2e/MJ$.

   The changes in values for the 2010 baseline fuels from the ISOR to the proposed 15-day changes are shown below:

   - The CI for CARBOB changed from 100.58 to 99.78
   - The CI for diesel changed from 102.82 to 102.01
   - The CI for CaRFG changed from 99.18 to 98.47

   The 2010 CIs for CARBOB, diesel, and the ethanol mix used in California become the basis for the LCFS annual performance standards. The percent reductions in CI that were proposed in the ISOR (2.0, 3.5, 5.0, 7.5 and 10.0

[2] Argonne National Laboratory 2008, Full Fuel-Cycle Comparison of Forklift Propulsion Systems http://www.transportation.anl.gov/pdfs/TA/537.pdf

percent in 2016, 2017, 2018, 2019 and 2020, respectively) have been applied to the base year CIs to calculate the annual standards.

7. The 2010 baseline CIs are used in the regulation to define the targeted ten percent reduction in fuel CI by 2020, as well as the increments of progress between 2016 and 2020.
8. In section 95485(b)(2), the definitions of deficit and credit types were revised to provide clarity in how credits and deficits relate to the compliance period upon calculation in the reporting tool.
9. In section 95485(c)(3)(E), the cost containment market requires that regulated parties that pledge credits for sale must accept any offer to purchase credits at that year's maximum price. In response to stakeholder comment, this section was clarified to indicate that credits that have already been sold or credits that have been contractually agreed to be sold are exempt from this requirement, as they cannot be sold more than once.
10. In section 95485(c)(5), as an incentive to retire deficits more quickly, the proposed regulation imposes an interest charge on accumulated deficits that are not repaid within a year from the date the deficit was carried over. However, staff analysis of the proposed language indicates that a regulated party with such an obligation could avoid interest on accumulated deficits by using credits needed for current year compliance to retire deficits carried over from a previous compliance period. This section is clarified to indicate that accumulated deficits cannot be retired unless the regulated party has fully met its current year compliance obligation.
11. In section 95485, staff is proposing changes to subsection (d) to limit credits generated from sections 95489(f) and (g). The credits generated from sections 95489(f) and (g) are new pilot provisions. Therefore, limits are being set on the credits generated from sections 95489(f) and (g) in section 95485(d) to allow staff time to evaluate the credit potential from these provisions and prevent any unanticipated impacts if the volumes of these credits outstrip current expectations.
12. In section 95486(a)(4)(A), staff is proposing a change that would make the deadline for completing a carryback credit transfer in the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS) consistent with credit transfer provisions elsewhere in the regulation. The language in this section would require that the timeframe for completing a carryback credit transfer from the date of initiation be 10 days. This eliminates the April 15$^{th}$ date for completing a credit carryback transfer as currently proposed.
13. In section 95486(a)(4)(B), the original proposal limits the use of carryback credits to parties that can acquire sufficient carryback credits to meet one hundred percent of their prior compliance year obligation. Staff is concerned that this unnecessarily eliminates the use of such credits to minimize a shortfall in compliance in situations where a regulated party wishes to reduce its shortfall as much as possible, but was unable to secure sufficient credits to fully eliminate all deficits. Staff is also concerned that the proposed limitation could adversely affect the credit market by increasing competition for limited numbers of credits during the carryback period and producing short-term price spikes in credit

prices. The revision would allow a party to use carryback credits to meet a portion of its compliance shortfall so long as the party minimizes its shortfall by also retiring all credits it possess that are eligible for use in the prior compliance year.

14. In section 95486(b)(1), Table 3, the original proposal provided a value for the energy density of natural gas which was later determined to be inconsistent with the reference conditions given in the California Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation version 2.0 (CA-GREET 2.0) model. The value has been adjusted to the reference conditions, 32°F and 1 atm. The unit (scf) was changed to eliminate confusion between industry "standard cubic feet" and the reference conditions used in the CA-GREET 2.0 model. Pure methane was added to the table for use with biomethane, which may contain variable concentrations of methane. "CNG" was changed to "Natural Gas" because the given energy density is at a reference temperature and pressure (1 atm), which does not correspond to compressed natural gas. "Undenatured Anhydrous Ethanol" was added to the table to eliminate confusion: the CA-GREET 2.0 model specifies and uses the energy density of undenatured anhydrous ethanol to calculate the CI of denatured ethanol, while the Denatured Ethanol value may be useful for reporting or compliance purposes.
15. In section 95486(c), Credit Generation Frequency has been revised to align the current accounting system with how the LCFS Reporting Tool is handling quarterly reports. Regulated parties have the ability to review their business partners' transactions related to their company and reconcile the data in a timely manner.
16. In section 95487(b)(1), staff is proposing to remove subsection (C) as part of the moveaway from a 90 percent threshold compliance to a new credit clearance market. Therefore, parties will only determine whether they are compliant or not.
17. In section 95488, staff is proposing to combine the Tier 2 Lookup Tables (Tables 6 and 7, formerly Tables 5 and 6) to one table (Table 6) since the CIs of the CNG, electricity, and hydrogen groups are the same on both tables for gasoline (CARBOB) and diesel (ULSD) substitutes.
18. Changes were made in section 95488(a)(3), (c)(5), and (e)(5), because the proposal will result in the need for staff to recertify approximately 270 existing fuel pathways before they expire on January 1, 2017. Staff proposes a system for prioritizing that work and eliminating potentially unrealistic deadlines in various parts of the existing proposal. The pathway renewal process will result in fuel providers obtaining different carbon intensity scores, some higher, some lower, than are currently assigned. Specifically, staff proposes to review and approve fuel pathway applications in batches based on fuel type, so that providers of the same fuel compete on equal terms, obtaining the new carbon intensity score at the same time. The proposed prioritization of fuel types (the order in which the renewals will be completed) would be: ethanol, followed by biodiesel, renewable diesel, compressed natural gas, liquefied natural gas, and finally all others.
19. In section 95488(b)(3) and (c), carbon intensity determination for any fuel pathway includes the sum of direct CIs (from CA-GREET 2.0 or equivalent) and

an indirect land use change modifier (if applicable) or other indirect carbon intensity (if applicable). In the ISOR and proposed regulation text, the inclusion of iLUC values was referenced and understood to be part of the proposal, but the iLUC values were not explicitly included as a table in the regulation. Staff now proposes to include express iLUC values for 6 biofuels in Table 5 and to clarify that the total carbon intensity is the sum of direct CI and (if applicable) iLUC or other indirect CI.

20. In section 95488(c), staff is proposing to revise the CI values in Tables 6 and 7 (formerly Tables 5, 6, and 7) based on updates to the CA-GREET 2.0 model.
21. In sections 95488(c)(1) and (c)(4)(I)(10), staff is proposing to identify the Tier 1 and Tier 2 web portal by URL http://www.arb.ca.gov/lcfsrt and to change the name of the LCFS Producer Legal Responsibility Letter to LCFS Fuel Producer Attestation Letter so that the same letter can be identified and used in both the Alternative Fuel Registration System as well as Tier 1/Tier 2 applications. Staff also added a new requirement for online account registration prior to submitting a New Pathway Request Form.
22. In section 95488(c)(2)(C), specific language for the fuel producer attestation was added to the proposed regulation.
23. In section 95488(c)(5)(G), staff is proposing changes to clarify the requirements apply to new Tier 1 fuel pathway certification as well as recertification for all the existing fuel pathway process.
24. In section 95488(c)(5)(H), staff is proposing to extend the number of days allocated for public comments. Under the Tier 2 pathway application, staff is proposing to change "10 calendar days" to "10 business days" in response to comments received from non-governmental organizations and based on staff experience with comments received on pathway applications.
25. In section 95488(d)(2), staff is proposing to include Tier 1 fuel producers that apply for a provisional pathway. Tier 1 fuel producers were unintentionally excluded from the "provisional pathways" provision in the original proposal. As a result of the proposed change, Tier 1 fuel producers would receive the same treatment as Tier 2 fuel producers with respect to provisional pathways (if the facilities have been in full commercial production for at least one full calendar quarter, applicants can submit a provisional pathway application).
26. In section 95488(e), staff is clarifying that existing physical pathway demonstrations that were approved under the previous regulation order will be "grandfathered" (accepted without any resubmittal requirements) during the pathway recertification process.
27. In section 95489, Table 8, the original proposal for Table 8 included all crudes supplied to California refineries from 2010 through the second quarter of 2014. Staff is proposing now to add additional crudes that were supplied to California refineries during the third and fourth quarters of 2014 along with additional crude names that regulated parties have said they are considering for purchase in the future.
28. In section 95489, Table 8, in the original proposal, the CI value for Utah Sweet was estimated as 6.14 $gCO_{2e}$/MJ. An error in the crude production data table for

this crude was noted and corrected. Staff is proposing an updated CI value for this crude.

29. In section 95489, Table 8, the original proposal for Table 8 did not include any crude names from Iran because of U.S. sanctions. It is possible that sanctions may be lifted in the near future resulting in potential import of Iranian crude to California. Therefore, these values were added.
30. In section 95489, Table 8 and Table 10 (formerly Table 11), one of the low-complexity/low-energy-use refineries has requested that we add CI values to Table 8 and Table 10 (formerly Table 11) for two sub-field crude names, Edison Light and South Belridge Light. At both of these fields, both heavy crude and light crude are produced from different oil pools. The heavy crude is produced with steam injection while the light crude does not use steam injection. The refinery is considering the option for refinery-specific incremental deficit accounting and would like the CI values to reflect the light crude that they purchase. Staff agrees with this request and is proposing to add these sub-field crude names and CI values to Table 8 and Table 10 (formerly Table 11).
31. In section 95489, carbon intensity values in Table 8 and Table 10 (formerly Table 11) of the original proposal were estimated with Oil Production Greenhouse gas Emissions Estimator (OPGEE) Version 1.1 Draft D. In response to stakeholder comments, staff is proposing that the Steam Injection sheet of OPGEE be revised to incorporate a higher default steam generator inlet temperature and to correct the default heat recovery steam generator exhaust temperature. The proposed revisions to OPGEE in version 1.1 Draft E require that CI values for all crudes produced using steam injection be re-estimated. Staff is proposing updates to the CI values for these crudes, as well as the 2010 Baseline Crude Average CI and the Default CI;
32. In section 95489(b), the original proposal provides three equations for calculating the 2010 Baseline Crude Average CI for years 2015, 2016, and 2017 and beyond. The proposed changes to OPGEE Version 1.1 Draft E affect the calculation of the 2010 Baseline Crude Average CI. Staff is proposing that equations in section 95489(b) be updated to reflect the revisions to OPGEE and the 2010 Baseline Crude Average CI.
33. In sections 95489(b) and (e), the original proposal assesses an incremental deficit if the Three-year California Crude Average carbon intensity value exceeds the 2010 Baseline Crude Average carbon intensity. Stakeholders commented that in order to avoid increased regulatory and reporting burden for small changes in crude CI, the difference between the Three-year California Crude Average CI and the 2010 Baseline Crude Average CI should exceed a de minimus level (e.g., 0.1 $gCO_2e/MJ$) before an incremental deficit is incurred. Staff agrees and is proposing to include a 0.10 $gCO_2e/MJ$ de minimus threshold for both the California Average incremental deficit, section 95489(b), and the refinery-specific incremental deficit, section 95489(e)(4). Under the revised language, an incremental deficit will only be triggered if the Three-year California Crude Average CI exceeds the 2010 Baseline Crude Average CI by more than 0.10 $gCO_2e/MJ$, but if an incremental deficit is triggered, the resulting incremental deficit will still be calculated relative to the 2010 Baseline Crude Average CI.

34. In section 95489, the original proposal does not clearly indicate that regulated parties for CARBOB and diesel are only assessed deficits on the finished fuels supplied to the California market. The proposed revision to the definition for $E^{XD}$ in sections 95489(b) and 95489(e)(4)(B) clarifies this intent.
35. In section 95489(d), the original proposal for the Innovative Crude Provision allows for the use of a simplified application process and default credit calculation for generation of solar steam with a quality of 65 percent or greater. Because generation of lower quality steam is sometimes necessary due to water quality issues, stakeholders have suggested a lower limit of 55 percent quality steam. Staff agrees with this suggestion and is proposing to modify section 95489(d) to allow for the use of the simplified application process and default credit calculation for generation of solar steam with a quality of 55 percent or greater;
36. In section 95489(d)(1)(F), the original proposal for the Innovative Crude Provision lists default credit calculations for solar steam generation. The proposed changes to the steam injection sheet for OPGEE Version 1.1 Draft E result in a revised emissions credit for displacing natural gas fueled steam generation with solar steam generation. Therefore, staff is proposing that the default credit values for solar steam generation in section 95489(d)(1)(F) be changed to reflect the changes to OPGEE;
37. In section 95489(e), staff inadvertently omitted from the original proposal language to prohibit selling or transferring of the credits generated from this section, as well as equations that were overly complicated. Therefore, staff is proposing to add language to prohibit the selling and trading of credits generated in section 95489(e) and modifications to simplify the equations in this section.
38. In section 95489(e)(4)(C), under the original proposal for refinery-specific incremental deficit accounting, new crudes not listed in Table 8 would be assigned a default carbon intensity equal to the California 2010 Baseline Crude Average CI. Staff is concerned that this California Average default may not represent the type of crude purchased by low-complexity/low-energy-use refineries, and therefore, is not the best default value to use for refinery-specific accounting. Therefore, staff is proposing to instead use the Refinery 2010 Baseline Crude Average CI as the default for those refineries that opt for refinery-specific incremental deficit accounting.
39. Sections 95489(f) and (g), contain the refinery investment provision and a renewable hydrogen refinery credit provision. In the original proposal, these two concepts were merged under the refinery investment provision. Staff suggested modifications to the original proposal at the Board Hearing, including clarifications to the refinery investment provision. As a result, staff split the refinery investment provision into two sections for clarity. Staff also added language to clarify the types of projects that would be ineligible for the investment credit and language to limit the number of credits that could be applied to the regulated party's deficits annually.
40. In section 95490, staff is proposing to delete the multimedia evaluation (MME) provisions from the LCFS as unnecessary and largely duplicative of existing law. This requires deletion of the following provisions from the regulation that staff originally proposed: 1) deletion of section 95490 in its entirety, 2) deletion of

the definition of MME from section 95481(a)(59), and 3) deletion of the application requirements related to MME at section 95488(c)(4)(G)6.d.

Health and Safety Code section 43830.8 requires a MME be conducted before ARB adopts a regulation that establishes a fuel specification. LCFS does not establish any fuel specifications, and while some new transportation fuels may need fuel specifications in the future, any that are adopted will be added to ARB's fuel regulations in Title 13, California Code of Regulations, rather than to the LCFS regulation. Title 13 already establishes fuel specifications for the following alternative fuels: M100 and M85 methanol, E100 and E85 ethanol, compressed natural gas, liquefied petroleum gas, and hydrogen. As noted above, if any new fuel that substitutes for gasoline establishes a fuel specification in the future, the MME will be conducted as required by the Health and Safety Code without parallel requirements in the LCFS regulation.

41. In section 95491, staff is proposing to include a table of the Annual Compliance Calendar (Table 12) to further clarify submission dates of the quarterly and annual reports, while also showing the timeline of the Credit Clearance Market.
42. In section 95491(a)(1)(A), given the modifications to section 95491(a)(3)(D), an Electrical Distribution Utility that opts into the program would not be able to meet the quarterly reporting deadlines due to the fact that ARB will provide estimated electricity amounts and calculate the credits or deficits generated annually for them. Therefore, the provision mandating quarterly reports has been modified to recognize the exemptions added in separate provisions.
43. In section 95491(a)(7), staff is proposing a change that will limit report correction requests to the quarterly reports within the current compliance period.
44. The current LCFS Regulation, amended in 2011, allows the use of estimation methods to calculate credits for electricity dispensed to vehicles at residences prior to 2015. However, effective January 1, 2015, the current regulation requires direct metering be used. Presently, for most residential charging, direct metering has not been installed. The originally proposed text would continue the practice of using an estimation method to calculate these credits under the new regulation. However, the original proposal did not clearly address the year 2015 – which will precede any likely effective date for the proposed regulation. Therefore, staff proposes the following modifications at section 95491(a)(3)(D):
    a. Allow 2015 estimation, thus ensuring continuity in how residential charging is reported.
    b. Establish an annual schedule for reporting and calculating residential EV charging that allows time for reporting and calculating the pertinent information for the previous year.
    c. Have ARB perform this calculation rather than the reporting party.
45. In section 95491(c)(1)(A)7., staff is proposing to make this provision more consistent with the reporting requirements by clarifying that the PTD requirements for the Fuel Production Company ID and Facility ID are not intended for CARBOB, diesel fuel, and Fossil NG fuel.

46. In section 95494, language was modified to clarify that penalties may be assessed for each day of violation of any part of the subarticle (and not subsection). Staff also eliminated one of two alternative penalty approaches.
47. In section 95495, staff is proposing a definition of "material information" to capture a wide variety of information and data submitted in connection with obtaining a pathway and CI score as well as the information reported in LRT-CBTS. "Material information" is information that affects the CI score. All CIs are calculated to two decimal places. They constitute maxima: actual fuel production CIs shall not be above the certified CIs, as calculated on a 12-month average basis. Similarly, transaction volumes reported in LRT-CBTS might be inaccurate by a few gallons, without changing the number of credits or deficits generated by more than a fraction of one credit or deficit, and would be immaterial. Larger reporting errors could result in generation of one or more additional credits or deficits, and would be considered material.
48. In section 95496, staff has added a "progress report" that will be presented to the board by July 30, 2017 focused on progress against the LCFS targets, the volumes of low carbon fuels used in California, and the performance of additional crediting provisions added through this rulemaking. Staff made this change to address Board direction and in response to stakeholder comment.
    Two statutes listed as authority are proposed to be stricken. Staff has determined that those two provisions do not provide independent authority for the overall proposal.

These modifications, separate modifications to the proposed Alternative Diesel Fuel (ADF) regulation, and new information that has become available since December 2014 do not change implementation of the two regulations or the environmental setting in any way that affects the conclusions of the draft environmental analysis that was prepared for the proposed LCFS and ADF regulations. The modifications consist primarily of clarifications and limited substantive changes that will not substantially alter the compliance response to the proposed regulations. ARB staff anticipates changes to the environmental analysis to clarify and amplify the draft analysis, but does not anticipate revising the conclusions in its draft environmental analysis or recirculating the analysis for further public comment before the Board considers approving the analysis.

## Additional Documents (or Incorporated Documents) Added to the Record

In the interest of completeness, staff has also added to the rulemaking record and invites comments on the following additional documents:

### Documents Incorporated by Reference

1. Agro-Ecological Zone Emissions Factor (AEZ-EF) model (December 31, 2014), incorporated at section 95481(a)(3) (available at http://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/lcfs_meetings.htm #11202014)
2. California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation model, Version 2.0-T1 (CA-GREET 2.0-T1) (May 22, 2015),

incorporated at sections 95481(a)(17) and 95488(c)(4)(F)1.a. (available at http://www.arb.ca.gov/fuels/lcfs/ca-greet/ca-greet.htm )
3. California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation model, Version 2.0-T2 (CA-GREET 2.0-T2) (May 22, 2015), incorporated at sections 95481(a)(17) and 95488(c)(4)(F)1.b. (available at http://www.arb.ca.gov/fuels/lcfs/ca-greet/ca-greet.htm )
4. Oil Production Greenhouse Gas Emissions Estimator (OPGEE) model, Version 1.1 Draft E (April 6, 2015), incorporated at section 95481(a)(61) (available at http://www.arb.ca.gov/fuels/lcfs/crude-oil/crude-oil.htm )

**Additional References and Supplemental Documents**


1. Governor's White Paper. *The Role of a Low Carbon Fuel Standard in Reducing Greenhouse Gas Emissions and Protecting Our Economy*. January 8, 2007
2. Argonne National Laboratory 2008. Full Fuel-Cycle Comparison of Forklift Propulsion Systems
3. Malins, C., Nic Lutsey, Sebastian Galarza, Zhenying Shao, Stephanie Searle (ICCT), Claire Chudziak, Maarten van den Berg. "Potential low- carbon fuel supply to the Pacific Coast region of North America." January 23, 2015
4. Government of Brazil, Empresa de Pesquisa Energetica Agency of the Ministry of Mines and Energy. "Brazilian Energy Balance (for 2010-2012)"
5. U.S. Department of Energy. "EV Project Electric Vehicle Charging Infrastructure Summary Report." July 10, 2014
6. California Energy Commission. 2015. "*2014 Draft Integrated Energy Policy Report Update*. Publication Number: CEC-100-2014-001-CMF
7. David Roland-Holst, University of California, Berkeley. "Plug-in Electric Vehicle Deployment in California: An Economic Assessment." September 2012
8. Pennsylvania State University. *Federal Transit Bus Test*. Report Number: LTI-BT-R1307. June 27, 2014.
9. Pennsylvania State University. Research Study. STURAA Test, 12 Year 500,000 Mile Bus from Proterra, Inc., Model BE-35. April 2012
10. Pennsylvania State University. Research Study. Partial STURRA Test, 12 Year 500,000 Mile Bus from New Flyer of America. Model XD40. November 2012.
11. California Air Resources Board. "Low Carbon Fuel Standard Re-Adoption Concept Paper." March 2014
12. Eric Sauer, California Trucking Association. Comment letter to ARB. June 24, 2014
13. Michael S. Waugh, ARB. Letter to Growth Energy. June 5, 2014
14. Chris Hessler, AJW. "Brazilian flow realities to California for 2020." Email correspondence to Wes Ingram, ARB. April 1, 2015
15. California Air Resources Board. Method 2B Application: Great Plains Ethanol, LLC dba Poet Biorefining Chancellor Corn and Sorghum Ethanol. March 3, 2014
16. California Air Resources Board. Carbon Intensity for Costa Pinto Mill, Raizen Energia S.A. Method 2B Application for Brazilian Sugarcane By-Product Molassess-to-Ethanol. April 14, 2014

17. Sao Miguel dos Campos, Alagoas State, Brazil, GranBio BioFlex Plant Method 2B LCFS Application for the Production of Cellulosic Ethanol from Sugarcane Straw. October 24, 2014
18. California Air Resources Board,. "Detailed California-Modified GREET Pathways for Brazilian Sugarcane Ethanol: Average Brazilian Ethanol, with Mechanized Harvesting and Electricity Co-product Credit, With Electricity Co-product Credit." September 23, 2009
19. Wang, M. Center for Transportation Research, Argonne National Laboratory. "Life-Cycle Energy Use and GHG Emission Implications of Brazilian Sugarcane Ethanol Production Simulated with the GREET Model." July 20, 2007.
20. Executive Order S-01-07
21. California Air Resources Board. "Default Credit Calculation for Innovative Crude Production Methods." April 9, 2015
22. California Air Resources Board. "Estimating Carbon Intensity Values for the Crude Lookup Table." April 10, 2015
23. California Air Resources Board. "Explanation of Modifications to the 2010 Carbon Intensity Portion of California Reformulated Gasoline Related to Ethanol Content." April 8, 2015
24. California Air Resources Board. "Analysis of Compliance Curve Reflecting the Impact of May 2015 Proposed 15-Day Changes." May 22, 2015
25. Richard W. Corey, ARB Executive Officer. Richard W. Corey to Mary Nichols, Chairman, and Air Resources Board. "Second Advisory Panel Review of the Low Carbon Fuel Standard Program" (including transcript). May 13, 2015
26. Gerald W. Bowes, Ph.D., State Water Resources Control Board. Letter to James Aguila, ARB. "Request for External Peer Review of Staff's Methodology in Calculating Fuel Carbon Intensities and Use of Three Life Cycle Greenhouse Gas Emissions Models" (including External Scientific Peer Reviews and other documents). May 5, 2015 (available at http://www.arb.ca.gov/fuels/lcfs/peerreview/peerreview.htm)
27. California Air Resources Board. "Staff Report: Calculating Life Cycle Carbon Intensity Values of Transportation Fuels in California." March 2015 (available at http://www.arb.ca.gov/fuels/lcfs/peerreview/peerreview.htm)
28. California Air Resources Board. "Staff Report: Calculating Carbon Intensity Values of Crude Oil Supplied to California Refineries." March 2015 (available at http://www.arb.ca.gov/fuels/lcfs/peerreview/peerreview.htm)
29. California Air Resources Board. "Staff Report: Calculating Carbon Intensity Values from Indirect Land Use Change of Crop-Based Biofuels." March 2015 (available at http://www.arb.ca.gov/fuels/lcfs/peerreview/peerreview.htm)

Although ARB did not rely on the following nine documents in developing the proposed regulation, and despite the fact that none of these documents were comments on the proposal, ARB is placing them into the rulemaking record for the public to review because these documents might be characterized as containing non-privileged factual information submitted to ARB from ARB consultants.

1. 6/5/2014 email from Susan Boland to Chan Pham, with (three attachments are on a compact disc due to their large size and Microsoft Excel format).
2. 6/5/2014 email from Stefan Unnasch to Hafizur Chowdhury, with attachment.
3. 3/4/2014 emails between Anil Baral, Adam Brandt, and James Duffy.
4. 4/11/2014 email from Nathan Parker to Jeremy Herbert, with attachment.
5. 7/31/2014 emails between Jennifer Pont, Stefan Unnasch, and Chan Pham.
6. 3/27/14 emails between Nathan Parker and Kirsten King, with attachment.
7. 6/30/2014 email from Chris Brown to Kirsten King.
8. 10/23/13 email from Nathan Parker to Kirsten King, with attachments.
9. 3/27/2014 email from Paul Gruber to Jim McKinney, with attachment.

All the documents listed above are available for inspection at ARB offices at 1001 I Street, Sacramento, CA 95814. Please contact Trini Balcazar, Regulations Coordinator, at (916) 445-9564 to arrange for inspection of the documents.

**Agency Contacts**

Inquiries concerning the substance of the proposed regulation may be directed to Samuel Wade, Branch Chief, Transportation Fuels Branch, at (916) 322-8263, or Katrina Sideco, Air Resources Engineer, at (916) 323-1082.

**Public Comments**

Written comments will only be accepted on the modifications identified in this notice and may be submitted by postal mail or electronic mail submittal as follows:

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 verbal 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.

In order to be considered by the Executive Officer, comments must be directed to ARB in one of the two forms described above and received by ARB by 5:00 p.m., on the deadline date for public comment listed at the beginning of this notice. Only comments relating to the above-described modifications to the text of the regulations will be considered by the Executive Officer.

If you need this document in an alternate format or another language, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 no later than five (5) business days from the release date of this notice. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Si necesita este documento en un formato alterno u otro idioma, por favor llame a la oficina del Secretario del Consejo de Recursos Atmosféricos al (916) 322-5594 o envíe un fax al (916) 322-3928 no menos de cinco (5) días laborales a partir de la fecha del lanzamiento de este aviso. Para el Servicio Telefónico de California para Personas con Problemas Auditivos, ó de teléfonos TDD pueden marcar al 711.

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: June 4, 2015

Attachments

*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 ARB's website at www.arb.ca.gov.*