FLINT HILLS resources

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Clerk of the Board, Air Resources Board
1001 I Street
Sacramento, CA 95814

Comments: Proposed Amendments to the Low Carbon Fuel Standard Regulation and to the Regulation on Commercialization of Altnernative Diesel Fuels

To the California Air Resources Board:

Flint Hills Resources (FHR) is pleased to submit these comments to the proposed amendments to the Low Carbon Fuel Standard (LCFS) and to the Regulation on Commercialization of Alternative Diesel Fuels (ADF) to be considered at the meeting of the Board on April 27, 2018.

FHR operates fuel ethanol plants in Iowa, Nebraska, and Georgia as well as a biodiesel plant in Nebraska. We produce a large quantity of ethanol and biodiesel that may be sold within the state of California.

Land Use Change (LUC) Carbon Intensity (CI) Values

The California Resources Board (CARB) proposes to keep the current LUC CI values because "staff has not observed sufficient evidence in literature to justify modifying LUC CI values." For the following reasons, FHR believes the sufficient evidence exists to support modifying LUC CI values.

During the 2015 LCFS Re-adoption rulemaking process, CARB staff committed to undertaking a review of the latest scientific data for LUC and update the LUC values for the appropriate biofuels. According to the literature citations provided throughout the 2013-2015 LCFS public workshops, and other regulatory documents (including the 2015 LCFS Re-adoption Initial Statement of Reasons (ISOR) and Final Statement of Reasons (FSOR)), the scientific data was based on literature published prior to 2014. From this review, CARB updated the LUC values for 6 biofuel feedstocks during the 2015 LCFS Re-adoption.

Since 2014, there have been numerous peer-reviewed publications, dissertations, and other scientific literature, focussed on various aspects of LUC related to biofuels, as listed within Appendix A. There have been additional peer-reviewed publications and model updates that were not included in any aspect of the 2015 rulemaking, as presented in Appendix B. FHR contends that now is the appropriate time for CARB staff to conduct a review of these additional publications and global economic model updates during the upcoming rulemaking process. FHR's more detailed comments are as follows:

1. ***CARB should use the latest available scientific data, specifically GTAP Version 9 (Baldos, 2017) with baseline data from 2011, to assess the impacts on LUC values. CARB should also include the biofuels update to GTAP 9 (Taheripour, 2016).***

Since the conclusion of the 2015 LCFS Rulemaking, GTAP Version 9 has been released with base year 2011 data, providing a more accurate depiction of land-use than the previously used base year 2004 data, when crop-based biofuels were being produced at a fraction of 2011 production levels.

Please also make note of CARB's response to PR-26 within the 2015 LCFS Re-adoption FSOR which acknowledged the need for updates and the potential affect the updates would have in the LUC estimate: "Purdue is currently in the process of updating the baseline to a 2010 timeframe. When the update is completed, CARB will consider updating the LUC analysis. Refining the baseline of the model may change the LUC estimate."

2. ***CARB should use the Carbon Calculator for Land Use Change (CCLUB) from Biofuels Production in the assessment of the impacts on LUC values (Dunn, 2016).***

   New scientific research has been released since the 2014 timeframe. This research has undergone rigorous independent peer reviews and was incorporated into the modeling of the latest iLUC values using CCLUB16 and Winrock. These updates provide results, as determined in the recent report published for the USDA (Flugge, 2017) that are superior to those calculated with the current AEZ-EF model.

   Based on our review of CCLUB16, the database and elasticity values used to assess land use area changes and carbon stock factors provide carbon impacts closer to an IPCC Tier 3. FHR believes that the CCLUB16 model addresses the problematic assumptions identified by CARB within the FSOR to the 2015 LCFS Re-adoption rulemaking.

FHR requests CARB to use the referenced sources and models included in Appendix A and B respectively to produce revised iLUC values that are more representative of actual, real-world emissions as published by various experts in this field. (According to Flugge, the iLUC for corn ethanol should be 5,913 g CO2e/MMBTU.)

Credit for Renewable Electricity

CARB proposes to allow wind/solar power generation CI reduction credit at fuel production facilities only when the renewable power is directly connected to the fuel production facility. CARB also proposes allowing CI reduction credit for renewable electricity for ZEV charging at stations not directly connected to the renewable electricity source.

1. ***CARB should treat parties equally either: (a) by allowing renewable electricity credits to be acquired and retired for use in reducing carbon intensity at fuel production facilities; or (b) by requiring ZEV charging stations be directly connected to a renewable electricity source to receive credit.***

   CARB has required fuel production facilities to have renewable electricity production directly connected to fuel production facilities in order to receive CI reduction credit. CARB does not provide justification for providing more favorable treatment to other transportation energy sources.

Quarterly Reporting Deadlines

CARB has set quarterly reporting deadlines to be the end of each following quarter.

1. ***CARB should shift the third quarter reporting deadline to January 15.***

   The December 31st reporting deadline is unique in that it is the only quarter end coinciding with significant holidays and associated vacation disruptions.

Carbon Capture and Sequestration Protocol

If approved as proposed, the Carbon Capture and Sequestration (CCS) Protocol would provide for a set of overly complex, onerous requirements that will likely create a barrier to implementation by conventional ethanol producers. With these regulatory barriers, along with significant capital investment and operational costs, it is unlikely that the staff estimated 1.4-7.2 million metric tons of CO2 sequestered in California, and elsewhere, by 2030 will be realistically achieved. Therefore, FHR proposes the following CCS Protocol simplifications:

1. ***CARB should simplify the Accounting Requirements for CCS Projects under the LCFS to the measurement of CO2 injected into the geologic formation***.

   Only CO2 injected into the geologic formation at the sequestration site would be used to generate LCFS credits and other lifecycle CCS project emissions are likely to be small in comparison to the quantity injected. As an alternative, and if deemed necessary, CCS project emissions could be evaluated one-time to determine the metric tons of CO2 Project Emissions per metric ton of CO2 Injected and deducted from each quantity of CO2 injected before credit generation.

2. ***CARB should modify the Permanence Requirements for Geologic Sequestration by requiring CCS Project Operators to solely meet the USEPA Underground Injection Control (UIC) Class VI rule requirements***.

   On December 10, 2010, USEPA issued federal requirements under the Safe Drinking Water Act (SDWA) UIC Program for carbon dioxide geologic sequestration within a new well class, Class VI (see 76 FR 56982). This rulemaking established the minimum technical criteria to protect underground sources of drinking water from the long-term storage of carbon dioxide, including:

   - Permitting
     - Geologic site characterization
     - Area of review (AOR) and corrective action
     - Financial responsibility
   - Well construction
   - Operation
     - Mechanical integrity testing (MIT)

    - Monitoring
- Well plugging
- Post-injection site care (PISC)
- Site closure

We believe that these federal requirements substantially meet the proposed Permanence Requirements for geologic CO2 sequestration and equally safeguard the potential risk of CO2 emissions downstream of the sequestration site.

ADF Mitigation Sunset

CARB proposes ADF mitigation continue until both on-road and off-road heavy-duty diesel engines have turned over to NTDEs.

1. ***CARB should bi-furcate the on-road and off-road mitigation.***

   Tax incentives should be sufficient to prevent on-road diesel from being used for off-road purposes.

Appendix A
LUC Literature Sources – post 2015 CA LCFS Readoption

Flugge, M., J. Lewandrowski, J. Rosenfeld, C. Boland, T. Hendrickson, K. Jaglo, S. Kolansky, K. Moffroid, M. Riley-Gilbert, D. Pape; A Life-cycle Analysis of the Greenhouse Gas Emissions of Corn-Based Ethanol. Report prepared by ICF under USDA Contract No. AG-3142-D-16-0243. 2017

Baldos, U. L.; Development of GTAP Version 9 Land Use and Land Cover Databases for Years 2004, 2007, and 2011, GTAP Research Memorandum No. 30., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2017

Tyner, W. E., F. Taheripour, S. K. Hoekman, A. Broch, V. Liu, J. Lyons; Follow-on Study of Transportation Fuel Life Cycle Analysis: Review of Current CARB and EPA Estimates of Land Use Change (LUC) Impacts, CRC Project E-88-3b., Sierra Research. 2016

Taheripour, F., L. Pena-Levano, W. E. Tyner; Introducing First and Second Generation Biofuels into GTAP data base Version 9, GTAP Research Memorandum No. 29., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2016

Dunn, J. B., Z. Qin, S. Mueller, H. Kwon, M. Wander, M. Wang; Carbon Calculator for Land Use Change from Biofuels Production (CCLUB), Argonne National Laboratory ESD/12-5 Rev. 3., 2016

Qin, Z., J. B. Dunn, H. Kwon, S. Mueller, M. Wander; Soil Carbon Sequestration and Land Use Change Associated with Biofuel Production: Empirical Evidence, GCB Bioenergy, 8: 66-80. DOI:10.1111/GCBB.12237, 2016

Qin, Z., J. B. Dunn, H. Kwon, S. Mueller, M. Wander; Influence of Spatially Dependent, Modeled Soil Carbon Emission Factors on Life-cycle Greenhouse Gas Emissions of Corn and Cellulosic Ethanol, GCB Bioenergy, DOI:10.1111/GCBB.12333, 2016

Levano, P., L. Moises, F. Taheripour, W. E. Tyner; Development of the GTAP Land Use Data Base for 2011, GTAP Research Memorandum No. 28., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2015

Qin, Z., C. Canter, J. B. Dunn, S. Mueller, H. Kwon, M. Wander, M. Wang; Incorporating agricultural management practices into the assessment of soil carbon change and life-cycle greenhouse gas emissions of corn stover ethanol production., Argonne National Laboratory ESD-15/26. DOI: 10.2172/1221938, 2015

Gibbs, H., S. Yui, R. Plevin; New Estimates of Soil and Biomass Carbon Stocks for Global Economic Models: GTAP Technical Paper No. 33., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2014 (Cited by ARB in Appendix I – Detailed Analysis for Indirect Land Use Change, and cited by ARB in FSOR Attachment 1 – Plain English Summary of Staff's Methodology in Calculating Fuel Carbon Intensities)

Taheripour, F., W. E. Tyner; Corn Oil Biofuel Land Use Change Emission Impacts: Sharing Emission Savings Between Ethanol and Biodiesel Biofuels, Biofuels, 5(4): p. 353-364, 2014

Taheripour, F., W. E. Tyner; Biofuels and Land Use Change: Applying Recent Evidence to Model Estimates, Applied Sciences, 3, 14-38. 2013 (Cited by ARB in Appendix I – Detailed Analysis for Indirect Land Use Change, Cited in FSOR Documentation)

Dunn, J. B., S. Mueller, H. Kwon, M.Q. Wang; Land-use Change and Greenhouse Gas Emissions from Corn and Cellulosic Ethanol. Biotechnology for Biofuels, 6, 51., 2013 (Article provided to ARB by commenter, Included in FSOR Documentation)

Appendix B
Models

GTAP (Global Trade Analysis Project) Model – Version 9

Base years: 2004, 2007, and 2011

Aguiar, Angel, Badri Narayanan, & Robert McDougall. "An Overview of the GTAP 9 Data Base." *Journal of Global Economic Analysis* 1, no. 1 (June 3,2016): 181-208.

A link to this publication may be found here:
https://jgea.org/resources/jgea/ojs/index.php/jgea/article/view/23

Taheripour, F., L. Pena-Levano, W. E. Tyner; Introducing First and Second Generation Biofuels into GTAP data base Version 9, GTAP Research Memorandum No. 29., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2016

GTAP 9 Land Use and Land Cover Data Base – data constructed from publicly available geospatial maps.

Base years: 2004, 2007, and 2011

Levano, P., L. Moises, F. Taheripour, W. E. Tyner; Development of the GTAP Land Use Data Base for 2011, GTAP Research Memorandum No. 28., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2015

Baldos, U. L.; Development of GTAP Version 9 Land Use and Land Cover Databases for Years 2004, 2007, and 2011, GTAP Research Memorandum No. 30., Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, 2017

CCLUB (Carbon Calculator for Land Use Change from Biofuels Production) – Updated 2016

Dunn, J. B., Z. Qin, S. Mueller, H. Kwon, M. Wander, M. Wang; Carbon Calculator for Land Use Change from Biofuels Production (CCLUB), Argonne National Laboratory ESD/12-5 Rev. 3., 2016