



June 18, 2020

Alexander "Lex" Mitchell
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Comments on Proposed Changes to the ADF Amendments

Dear Mr. Mitchell:

On behalf of Renewable Energy Group, I want to thank you for the opportunity to comment on the changes, proposed by staff of the California Air Resources Board (CARB) during your June 4th webinar, to the recently approved amendments to the Alternative Diesel Fuels (ADF) regulation.

Renewable Energy Group Inc., (REG), is leading the energy industry transition to sustainability by transforming renewable resources into high-quality, cleaner fuels. REG is an international producer of cleaner fuels and North America's largest producer of biodiesel and a leading producer of renewable diesel. REG solutions are alternatives for petroleum diesel and produce significantly lower carbon emissions. REG utilizes an integrated procurement, distribution and logistics network to operate 13 biorefineries in the U.S. and Europe. In 2019, REG produced 495 million gallons of cleaner fuel delivering 4.2 million metric tons of carbon reduction. REG is meeting the growing global demand for lower-carbon fuels and leading the way to a more sustainable future.

As you know, we have been active in the California market since the implementation of the LCFS under AB32. Since its inception, we have been a significant supplier of biodiesel in California and since 2015, a growing supplier of renewable diesel. In fact, as a manufacturer of both products, we feel uniquely qualified to provide input to the ADF package discussed by the Board April 23 and the concepts recently outlined in the Workshop June 4th.

We fully support the need to address NO_x in California and have consistently supported the ADF through its development and implementation. Since late last year, staff have characterized the currently proposed changes as small and technical in nature and focused on the need to address new data in the additives market. Unfortunately, the record bears out that the changes staff have proposed and continue to refine are more broad than anticipated and may impact the market in a number of unforeseen ways. These complex changes require engagement and interactive discussion with all stakeholders as the Board discussion during the April 23rd meeting affirms (see pages 103-120 Official Transcript).

RENEWABLE ENERGY GROUP

416 S. Bell Ave., Ames, IA 50010 / +1 888 REG 8686 / regi.com



We welcomed the opportunity to discuss the proposal in detail at the June 4th Workshop, unfortunately, in response to the challenges of COVID 19, an online only format was utilized. As staff would agree, the interaction between stakeholders was limited. The questions afforded stakeholders by the format were few and ultimately the information relayed by staff was complex and confusing. This is not the traditional iterative discussion and refinement of ideas that CARB has engaged in over the history of the ADF.

Nonetheless, we are encouraged by some of the proposed changes. We believe CARB is moving in the right direction with chain of custody requirements, which is a significant step, but we remain concerned about other key changes that appear inconsistent with the Board's direction and the Executive Officer's commitment to implement that direction.¹

In our comments, we will first provide technical analysis and background on REG's approach to our Executive Orders. We will then build upon that foundation as we focus our comments on four key areas: 1) REG's proprietary ADF registrations, 2) the lack of market realism in CARB's projections for BD use in California, 3) the appropriate ratio for renewable diesel and biodiesel to avoid an increase in overall NOx emissions, and 4) facility testing and the new three lab certification program.

Technical Background:

1. In 2011, CARB published a report containing extensive data on NOx emissions from a variety of blends of biodiesel (BD), renewable diesel (RD), and CARB petroleum diesel (PD). The RD tested by CARB in the 2011 data set was an unusual "arctic renewable diesel" with substantially lower cloud point, density, and cetane than the RD products that are actually being sold in the CA market today. The cetane number for this unusual RD was approximately 72, while the conventional RD that is available in CA today typically has a cetane number above 78. The low cetane RD used by CARB produces significantly higher NOx emissions than the conventional RD in the CA market today. REG's emissions testing work has independently confirmed this fact and found that a low cetane RD provides approximately 90% of the NOx reduction benefit that can reliably be expected from conventional RD. CARB's testing of an unusually low cetane RD led them to assume a NOx decrease for neat RD of approximately 10% compared to CARB

¹ "So a suggestion in the context of 15-day changes could be discretion, delegation, to the Executive Officer to respond to that growing body of data and make adjustments as appropriate in terms of the -- moving the two lab to one lab, for instance, as well as the previously defined status of the RD -- the renewable diesel biodiesel blend.... It would provide additional opportunity for us to work with the stakeholders to nail the language down." Richard Corey, Executive Officer Page 114-115, official transcript CARB Board April 23, 2020.



- diesel, while REG's testing of market RD indicates a NOx decrease of at least 11% compared to CARB diesel.
2. In the testing program documented in their 2011 report, CARB tested both a low cetane soybean oil biodiesel (SME) and a high cetane animal fat biodiesel (AFME). The CARB study showed NOx emissions were *significantly* different for the two biodiesel types, with the AFME exhibiting approximately 40% of the NOx increases exhibited by the SME as both neat BD and in blends with PD and RD. Because CA LCFS credit revenues strongly incentivize AFME over SME in the CA marketplace, only very small quantities of SME have been used in CA in recent years while substantial quantities of AFME have been both produced in-state and delivered from out-of-state. Even with consideration of the impact of feedstock mass-balancing allowances, it is a safe assumption that the representative cetane for biodiesel used in CA is significantly higher—and NOx emissions therefore significantly lower—than those of straight SME. In REG's estimation, a conservative assumption would be an equal-parts average of the two types of biodiesel tested by CARB. Per CARB's own data, this would indicate a NOx increase for neat biodiesel in the CA market of no more than 18% compared to CARB diesel rather than the 20% increase currently assumed by CARB staff.
 3. In two of our proprietary ADF registration applications, REG provided NOx emissions data that was obtained following CARB procedures confirming the NOx neutrality (NOx negativity, in fact) of RD/BD blends of 45/55 with conventional RD and 67/33 with a low cetane RD. As mentioned above, this low cetane RD isn't currently on the market, but it was used because it is consistent with the low cetane RD tested by CARB in their 2011 report. It is also important to note that the BD used in REG's testing conformed to CARB's aggressively conservative restriction that the ADF certification BD must have a cetane of 50 or less. Even though, as previously discuss, this means that the ADF certification BD had a lower cetane (and therefore higher NOx emissions) than the average of the biodiesel REG delivers into the state of California². In spite of this unfavorable (and unrealistic) limitation on our BD, REG ultimately earned proprietary Executive Orders for these two blends (i.e., a nominal 1:1 ratio of RD:BD with a proprietary RD and a 2:1 RD:BD ratio with an unusually low cetane RD).

REG's registrations for our proprietary renewable diesel/biodiesel blends (RD/BD) have arbitrarily been included in the rule change.

² It is worth noting again that the preferred use of animal fat and other higher-saturate feedstocks (such as used fryer grease) for biodiesel sold into the CA market is a reality that has been created by the higher value the CA LCFS program has created for fuels produced from such waste feedstocks.



For reasons that are still unclear, the language in the ADF amendments includes definitional changes adding “ADF Formulations” to Appendix 1, subarticle 2.³ While the word “formulation” is open to interpretation, in follow-up discussions with REG employees, CARB staff have indicated on two separate occasions that the Executive Orders for REG RD/BD blends would be subject to the new amendments requiring recertification and evaluation. REG strongly objects to this approach.

CARB established a clear and thorough process to evaluate and approve blends of RD/BD in the 2017 amendments. As discussed in note 3 of the Technical Background above, REG engaged in this process and submitted detailed data following CARB procedures that demonstrated the NO_x neutrality of RD/BD blends up to 55% BD (i.e., R45/B55) with REG proprietary RD and up to 33% BD (i.e., R67/B33) with an unusually low cetane RD. The test results supporting these registrations are clearly consistent with CARB’s published test results, which were based on CARB’s selection of an unfavorably non-representative RD (as described in note #1 of the Technical Background above) and which CARB is now using to justify their proposed allowance of RD/BD blends with a minimum RD:BD ratio of 2.75:1. If CARB perceives their NO_x data to be reliable enough to support the 2.75:1 ratio they have proposed, the REG data are, by obvious and reasonable extension, reliable enough to support the previously-acknowledged NO_x neutrality of REG’s proprietary ADF registered fuels.

In the light of CARB’s renewed concerns about actual NO_x emissions in the state of California, it would be reasonable for CARB and REG to engage on the allowed RD:BD ratios in REG’s proprietary fuel registrations by reviewing the large quantity of additional emissions data REG has generated on the path to our ADF applications, as well as any additional data CARB staff have generated since 2011. It seems unreasonable for CARB to arbitrarily reject our registrations in their entirety in the absence of any data supporting this decision. REG sincerely looks forward to engaging with CARB staff as they make informed decisions on this matter.

Not only is the unsupported rejection of our proprietary fuel registrations antithetical to the putative data driven nature of the ADF program, but such action unfairly and needlessly penalizes both REG and the residents of California, who will be deprived of proven NO_x neutral low-carbon fuel. REG has worked with CARB staff since 2017 to comply with the requirements of the ADF to develop and submit RD/BD blend certifications to the Executive Officer. REG has invested countless hours and significant dollars developing data packages that were ultimately approved. We have further spent significant resources to develop these market opportunities based on the rules CARB established; to change the rules midstream without supporting data is simply unfair.

³ Board package April 23, 2020; Appendix A: Proposed Regulation Page A-2/A-17



Raising further questions as to why blends are even part of these new Amendments, staff publicly indicated at the April 23rd Board Meeting that other fuel formulations, specifically dimethyl ether (DME), will not be subject to the new certification procedure.⁴ There is no logical basis for the differential treatment. Furthermore, REG’s ADF registrations are for our proprietary blends, which ensures control of the blending components and eliminates any risk of “off-license” blending of higher-NOx components.

REG asks that staff develop clear, unambiguous language stating REG’s existing registrations for our proprietary RD/BD blends are not subject to the new amendments.

CARB staff have grossly overestimated the amount of biodiesel that would grow in the marketplace as a justification for capping blends. Staff have proposed to cap blends at R55/B20 in order to “reserve” additional RD capacity to offset what we now know is unrealistic projections of growth in biodiesel. This proposal, shown in staff’s projections shared at the June 4th workshop (and shown below), appears to have been based on an illustrative example from previous rulemakings. However, illustrative examples are simply hypothetical numbers. They are not, nor should they ever be the basis of models, particularly models with economic stakes as significant as this. Had staff reviewed existing data on market penetration of RD and BD, or even worked with stakeholders like California Fuels and Convenience Store Alliance (CFCA) or the National Biodiesel Board (NBB), the projections would look significantly different and the need to reserve RD capacity would be nullified.

Table 1. Historical and Future Biodiesel, Renewable Diesel, Conventional Diesel, and Total Diesel Demand Volumes (CARB, June 4th webinar)

Year	Historical Volumes ¹									Future Volumes ²			
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BD Volume as B100 (million gal)	13	20	60	67	126	163	170	184	212	350	425	500	500
RD Volume as R100 (million gal)	1.8	8.8	117	113	165	256	335	384	618	650	750	850	900
RD Volume as R100 needed for full NOx mitigation of BD Volume as B100 ³ (million gal)	26	40	120	134	252	326	340	368	424	700	850	1000	1000
Conventional Diesel Volume (million gal)	3585	3575	3498	3487	3466	3382	3342	3210	2988	2688	2540	2392	2374
Total Diesel Demand ⁴ (million gal)	3600	3604	3675	3667	3757	3801	3847	3778	3818	3688	3715	3742	3774

As a manufacturer and supplier of both RD and BD into California, REG can attest that even the NBB projections provided below are likely to be overly optimistic regarding biodiesel demand growth in California.

⁴ “...and I had confirmed that the regulatory amendments that are in front of the Board today are not intended and do not impact the DME process that their company [Oberon] is involved in.” Rajinder Sota, Chief, Industrial Strategies Division April 23 Board Transcript page 103



Table 2. Historical and Future Biodiesel, Renewable Diesel, Conventional Diesel, and Total Diesel Demand Volumes (NBB, linear extrapolation from 2015-2019 LCFS data)

Year	Historical Volumes ¹									Future Volumes ²			
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BD Volume as B100 (million gal)	13	20	60	67	126	163	170	184	212	229	248	268	287
RD Volume as R100 (million gal)	1.8	8.8	117	113	165	256	335	384	618	662	765	869	972
RD Volume as R100 needed for full NOx mitigation of BD Volume as B100 ³ (million gal)	26	40	120	134	252	326	340	368	424	458	496	536	574
Conventional Diesel Volume (million gal)	3585	3575	3498	3487	3466	3382	3342	3210	2988	2688	2540	2392	2374
Total Diesel Demand ⁴ (million gal)	3600	3604	3675	3667	3757	3801	3847	3778	3818	3579	3553	3529	3633

CARB’s assignment of a 2.75:1 RD:BD ratio is arbitrary and unsupported.

Almost as troubling as staff’s unrealistically high BD projections is their insistence that a minimum RD:BD ratio of 2.75:1 is appropriate (based on what is now understood to be multiple overly conservative assumptions). Such an approach contradicts the Board’s stated direction; in direct response to a question from Board Member Mitchell, Executive Officer Richard Corey stated, “a suggestion in the context of 15-day changes could be discretion, delegation, to the Executive Officer to respond to that growing body of data and make adjustments as appropriate in terms of the previously defined status of the RD.”⁵ Taking the approach laid out in the workshop on June 4, which locks the blend ratio at 2.75:1, is the opposite of discretion and delegation.

Furthermore, staff appears to be conducting their analysis under the assumption that there is no additional biodiesel NOx mitigation provided by new technology diesel engines (NTDE) despite the fact that NTDEs already account for a significant percentage of vehicle miles traveled in the state. Staff appear to be missing the fact that the NOx mitigation benefits of NTDEs apply to all fuels. It is reasonable to assume that fuel is used proportionally by NTDEs and legacy engines. This reasonable assumption supports a conclusion that a corresponding percentage of the B5 gallons projected by CARB would be consumed in NTDEs, which in turn means the BD in the portion of B5 gallons used in NTDEs would contribute no increase in NOx emissions. Staff’s selection of a 2.75:1 RD:BD ratio when their own emissions data indicate NOx neutrality at a 2:1 RD:BD ratio appears to confirm their desire to maintain an “RD reserve” to cover any potential NOx impacts from the use of B5 blends.

NTDEs already contribute, and will increase in their contribution, to real and substantial reductions in NOx emissions for every gallon of every type of fuel used in them. Staff cannot ignore this reality by assuming that the biodiesel in B5 won’t benefit from NTDE use. CARB’s apparent disregard of the beneficial impact of NTDEs in the state reflects either poor understanding of the penetration of NTDEs in the market or a less than

⁵ April 23, 2020 Board Meeting Transcript page 115



rigorous modeling effort. REG asks that staff apply a proportional amount of the benefits of NTDE penetration to the B5 blends that they appear to believe require additional system-wide mitigation.

Under their current proposal, CARB would not be able to respond, short of another rulemaking, should there be any changes to the RD and BD volumes brought into California. It seems that this is not consistent with the intent of the Board discussion and is simply a poor regulatory policy. For example, should there be a significant and prolonged drop in RD (as additional political jurisdictions around the globe and in the US recognize the need to address climate change, the possibility of other governments developing their own clean fuel standards, while not imminent, is real), the state would still be locked in at R55/B20. Conversely, any reduction in biodiesel supply (due to disruptions in the supply chain from, say, the impacts of COVID 19) cannot be factored in allowing for lower blends of RD or higher blends of BD. As Executive Officer Corey stated during the April 23rd Board Meeting, “it's a dynamic environment and the ability to respond as that data set is involved seems to me to be an appropriate path.”

REG asks that staff develop clear, unambiguous language reaffirming the Executive Officer has the authority to move the RD/BD ratio for ADF formulations up or down depending on the actual emissions data and market penetration of renewable diesel and biodiesel.

As the Board directed, flexibility is important in other areas like facility testing.

Numerous Board members raised questions regarding the need for two testing facilities instead of one.⁶ Unfortunately, the new staff proposal in this area appears to be both complex and confusing while doing little to address the need for precise emissions data upon which to base additive certifications. At its most basic level, staff is suggesting that 3 plus 1 is less than or equal to 2.

REG asks that staff abandon the three engine proposal, agree to a single facility evaluation and work with industry on developing appropriate protocols which emphasize precision over complexity.

Lastly, while not the main focus of our comments, we would like to address the timing of these changes and the ability of industry to respond. The very earliest the Board could

⁶ Vice Chair Berg. “Understanding lab testing from a manufacturer perspective and needing to rely on those tests, I haven't passed -- two is not necessarily better than one. I think it's really important for us to understand where the breakdowns are and try to resolve from the breakdowns. Board member Balmes, “these are technical issues that are not -- shouldn't be solidified in a way that would be difficult to move forward on. I think it's much better to have the Executive Officer have discretion to work with industry to come up with a solution.” April 23 Board Meeting transcript p 116



approve additional amendments is the July Board meeting. Given the need to significantly revise the concepts from the workshop, that timing might be optimistic. Realistically, industry will have four, or at most five months, to resubmit any applications for new Executive Orders. Given the complexity presented at the Workshop, that timeframe is unrealistic and unworkable.

The Board reiterated their support for continued focus on NOx between now and when the changes to the ADF amendments would take effect.⁷ We wholeheartedly agree. Fortunately, staff's own analysis of previous year's data have shown an overall NOx decreases as well as a sufficient amount of RD to provide any NOx reductions over and above all biodiesel in the state. Given the impact of COVID 19 to the economy, vehicle miles are down and with it corresponding emissions from burning fossil fuels. Supply chain impacts have also meant less biodiesel available for sale in the state.

REG asks that staff change the effective implantation date to July 1, 2021 in order to allow business enough time to react and adjust to the new certification requirements.

In closing, we also want to direct staff to the comments submitted by the National Biodiesel Board. They provide additional detail around these and other issues; we agree with their comments and we wish to associate ourselves with their submission.

Thank you for your time and effort in this important and critical area. We agree with Board Member De La Torre, when he says, "we absolutely have to get this right." We look forward to continuing to work with staff toward that end.

Scott Hedderich,
Executive Director, Corporate Affairs

⁷ Board member Balmes, "I want to reiterate that reducing NOx emissions, especially related to diesel traffic through our disadvantaged communities has to be our primary goal here." April 23 Board Meeting transcript p 117