November 15, 2021

Clerks’ Office, California Air Resources Board

1001 I Street

Sacramento, California 95814

Electronic Submission via <https://www.arb.ca.gov/lispub/comm/bclist.php>

RE: Proposed Amendments to Commercial Harbor Craft Regulation (CHC2021)

Dear Clerk of the Board:

Renewable Energy Group, Inc. (REG) appreciates the opportunity to comment on the proposed amendments to the Commercial Harbor Craft (CHC) regulation.

REG is helping to leading the energy industry's transition to sustainability by converting renewable resources into high-quality, cleaner fuels. REG is an international producer of cleaner fuels and one of North America’s largest producers of advanced biodiesel (BD) and renewable diesel (RD). REG solutions are alternatives for petroleum diesel and produce significantly lower carbon emissions. REG utilizes an integrated procurement, distribution, and logistics network to operate 12 biorefineries in the U.S. and Europe. In 2020, REG produced 519 million gallons of cleaner fuel, delivering 4.2 million metric tons of carbon reduction. In California alone, REG has provided over 750 million gallons of biodiesel and renewable diesel to the state over the last decade (nearly 150 million gallons alone in 2020). REG is meeting the growing global demand for lower-carbon fuels and leading the way to a more sustainable future.

As members of the National Biodiesel Board (NBB) and the California Advanced Biofuels Alliance (CABA), we wish to align ourselves with the comments they have submitted. Below are areas that we wish to highlight and emphasize for your consideration.

Unsupported Restriction of Biodiesel/Renewable Diesel Blends

* Amend 93118.5(e)7A to allow RD/BD blends with up to 20% BD to qualify under the rule

The CHC rule as it is structured is set to limit CHC fuel use to R99 or R100 as defined by ASTM D975 to be used as fuel in CHC. We have asked staff to amend this provision to include up to 80/20 RD/BD blends as allowed in ADF appendix 1 sub article 2(a)(1)B approved ADF formulations, and to reflect the additional data submitted by REG to the agency under the ADF and approved and issued in the form of executive orders (Executive Order G-714-ADF02, Executive Order G-714-ADF06, and Executive Order G-714-ADF09). In fact, we are somewhat confused as to why CARB’s own regulation and supporting data weren’t included by reference within this rulemaking. The REG data is further expanded upon in Appendix A.

From our understanding, the R99 recommendation is to ensure that the renewable fuel used produces the most emission reductions possible. In practice, however, we believe this presents a number of challenges which we have highlighted below:

* The CHC regulation is intended to reduce all transportation emissions (The CHC ISOR (page I-2) references HSC § 43108(a) directs CARB to achieve “the maximum degree of emission reduction possible.”), but the use of R99/R100 is focused entirely on NOx reduction and represents an incomplete picture of all engine emissions. Page 3 of the Public Hearing notice states:

Communities located near California’s seaport complexes bear a disproportionate health burden due to their proximity to the emissions generated from freight activity associated with the seaports, including CHC operating in and around seaports and harbors. ***The DPM emitted by CHC continues to impact nearby communities,*** [emphasis added] including communities located in regions of the State that are in nonattainment with national ambient air quality standards (NAAQS) for ozone and PM2.5***. DPM is a toxic air contaminant that can substantially increase the risk of developing cancer and other health problems such as increased respiratory illnesses, risk of heart disease, and premature death*** [emphasis added].DPM emissions from CHC engines are projected to become even more significant due to the continued operation of CHC while emissions from other mobile sources are decreasing due to more stringent regulations and cleaner technologies.

* Blends of biodiesel with renewable diesel has the ability to achieve a greater degree of emission reduction than neat renewable diesel. While blends of RD and BD could have slightly higher engine-out NOx emissions than neat RD (both blends and neat RD represent NOx reductions compared to CARB diesel), they produce lower emissions of particulate matter and hydrocarbons which can have greater adverse health effects than NOx, not to mention their potential to enable greater greenhouse gas (GHG) reductions than neat RD.
* This rule making is intended to focus on overall air quality in disadvantaged communities surrounding ports and harbors, not solely NOx. Staff have chosen, by disallowing RD/BD blends, to forgo additional reductions in other criteria pollutants and GHGs in favor of potential reductions in RD NOx emissions over the NOx reductions in 80/20 blends. Restricting the use of biodiesel may reduce marginal amounts of engine-out NOx but, most definitely will result in an increase in other engine emissions, including DPM from neat RD combustion. These engine emissions are environmental pollutants and present real health risks to local communities.
* Emissions from R100 in a legacy (pre tier 3 engine) engine may see a NOx decrease of roughly 4% over the NOx reductions (compared to CARB diesel) from R80/B20 blends, however, there would be an increase in DPM of up to 12% compared to R80/B20. This trade off does not meet the stated goals of the rulemaking.
* While modern Tier 3 CHC engines currently include NOx mitigation aftertreatment they do not have DPM mitigation. This means if the data CARB used to make its ADF determinations on blends was in any way in error [it is not], any potential NOx increases from allowing up to 20% BD inclusion would still be mitigated with modern CHC engines while the more substantial DPM reduction benefits from BD blending would be prohibited allowing higher levels of DPM to still present in at-risk communities.
* ASTM D975 alone is an insufficient standard for determining whether R99/R100 is truly suitable for this class of engines. The technical specifications are not comprehensive and can miss some crucial fuel performance characteristics, which is why some engine manufacturers, including Wabtec, and some fuel system component manufacturers, including Bosch, are currently limiting RD inclusion recommendations to 30 – 50%.
* The use of R99/R100 may cause performance issues in the CHC engines where it will be used. For example, RD is an extremely non-polar fuel with different solvency and elastomer interactions than traditional diesel which may cause additives to separate out (particularly when fuel is contacted with water) and has been proven to cause legacy elastomers to shrink (see Figure B1 and references in Appendix B), which has been observed to contribute to problems such as fuel injector seal leakage. RD also has an extremely high Cetane Number which can cause combustion and timing issues in both lower speed and legacy engines. These and other effects have been observed in engine testing for certain locomotive engines which are very similar to the larger CHC engines under consideration. Including BD in RD can mitigate all of the undesirable attributes of neat RD that have been identified so far.(See Table B1 in Appendix B)
* The CHC rule as proposed is disharmonious with the current fuel allowed under ASTM D975. ASTM D975 allows for the inclusion of up to 5% biodiesel in the finished diesel fuel. Requiring neat RD only would prohibit a substantial amount of D975 diesel, including D975 RD which now often contains 5% BD, which is certain to create supply chain issues for the many smaller businesses that operate CHCs and do not have access to specialty fuel supplies. In short, D975 fuel, whether petroleum or RD, may contain up to 5% BD, which means this proposed rule creates an eventual requirement for a fuel that does not align fully to D975[[1]](#footnote-1).
* RD is currently in limited supply, in spite of the fact that nearly all RD consumed in the U.S. is used in California, and is projected to be fully subscribed for the foreseeable future. Allowing up to 20% BD inclusion increases the effective volumetric availability of RD by 20%, which can only relieve upward price pressure that will impact smaller businesses more acutely than larger operations.
* Lastly, the rulemaking contains changes to the Alternative Control of Emissions (ACE) section. Under the ACE, “an applicant would be able to comply by receiving approval from the Executive Officer (EO) to pursue an alternative that includes, but is not limited to, any combination of engine modifications, exhaust treatment control, engine repowers, ***use of alternative fuels*** [emphasis added] or additives, fleet averaging, or any other measures that, when implemented, will sufficiently reduce emissions equivalent to the emissions performance standards identified in the Proposed Amendments. Since blends of 80% renewable diesel and 20% biodiesel have already received full approval under the provisions of the Alternative Diesel Fuel regulation. We fully expect the EO’s orders to be extended to Harbor Craft. Admittedly, we wonder why staff would propose this step instead of simply referencing the emission data and work done under the ADF by allowing RD/BD blends of up to 80/20 to qualify under the rule. **Accordingly we ask that this change be made in any 15 day change authorized by the Board**

Unsupported Comments about Biodiesel

* Edit Appendix E to remove the biodiesel section

First, we wish to state that we are disappointed at the tenor and tone taken towards biodiesel within Appendix E section V(A) Biodiesel (page E52 – E54). CARB has required renewable diesel in a past rulemaking without disparaging biodiesel in the process (e.g. Innovative Clean Transit 2018[[2]](#footnote-2)). We simply do not understand why CARB chose to misrepresent a fuel that is approved for in-state usage, has seen over 1.4 billion gallons come to California since 2011[[3]](#footnote-3), and has delivered over 12.3M credits of carbon reduction to the LCFS program - which is 14.3% of all the credits generated for that program.

Many, if not all, of the claims made about biodiesel are simply wrong and/or based upon antiquated studies dating from 2006-2012 that are no longer relevant nor accurate in light of new data. We find it curious that these outdated reports have reemerged in current proceedings as they simply have no present day basis for relevance. Appendix E, in particular, is rife with misleading and unsupported claims about biodiesel which we request be struck from the record.

Like biodiesel, renewable diesel is also an invaluable renewable fuel (albeit much less widely used than biodiesel and with substantially less “real world” experience), but it is not what Appendix E claims it is. It is without irony that we point out the concerns raised about biodiesel also apply to renewable diesel (see Table B1 provided in support of these comments)

It is particularly confusing given how much data CARB has already accumulated on biodiesel and renewable diesel as a result of the Alternative Diesel Fuel (ADF) regulation. One particularly problematic example, from the ISOR is as follows: “biodiesel, which is a methyl ester compound that should not be used in high quantities with retrofit aftertreatment.” We have found no evidence to support the claim in Appendix E that biodiesel cannot be used in high quantities due to aftertreatment concerns.

CARB’s own findings in the 2015 ISOR for the ADF determined "Engines that meet the latest emission standards through the use of Selective Catalytic Reduction (SCR) have been shown to have no significant difference in NOx emissions based on the fuel used[[4]](#footnote-4)." It should be pointed out the study included testing B100 against CARB ULSD on an NTDE.

In terms of real world experience, the city of Ames, Iowa ran its snowplows with EPA Tier IV engines on B100 this past winter[[5]](#footnote-5) and its Tier IV work trucks on blends above B50 for the past nine months. Furthermore, we have received feedback from fuel users that R99 can cause engine performance issues in older diesel equipment, but those same users have indicated that an RD/BD blend eliminated those issues due to the superiority of biodiesel’s elastomer interactions compared to neat renewable diesel[[6]](#footnote-6). **Again, we ask that the section on biodiesel be deleted from Appendix E.**

Thank you for your consideration of our comments. Please feel free to contact us with any questions or comments.

Sincerely,

Scott Hedderich

Executive Director, Corporate Affairs

David Slade, Ph.D

Chief Technologist

Martin Haverly, Ph.D.

Sr. Manager, Innovation and Process Development

1. Interestingly, CARB staff seems to acknowledged awareness of this fact by allowing a vessel owner or operator to use R100 or R99 once the [fueling] contractual issues no longer exist, or by December 31, 2025, whichever occurs sooner. [↑](#footnote-ref-1)
2. <https://ww2.arb.ca.gov/rulemaking/2018/innovative-clean-transit-2018> [↑](#footnote-ref-2)
3. <https://ww3.arb.ca.gov/fuels/lcfs/lrtqsummaries.htm> [↑](#footnote-ref-3)
4. <https://www.arb.ca.gov/fuels/diesel/altdiesel/biodieseldurabilityreport2010_08_11.pdf?_ga=2.65803882.597300459.1636986053-1402025998.1635196007> [↑](#footnote-ref-4)
5. <https://www.regi.com/blogs/blog-details/resource-library/2020/03/30/getting-aggressive-with-sustainability> [↑](#footnote-ref-5)
6. <https://www.regi.com/docs/default-source/products/reg-18043_ultra_clean_diesel_fact_sheet_updated_2.pdf?sfvrsn=bcba8d1a_2> [↑](#footnote-ref-6)