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August 8, 2022

Ms. Cheryl Laskowski
Chief, Transportation Fuels Branch Strategies Division
California Air California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Improvements to CARB's LCFS program to Accelerate Maritime Decarbonization

Dear Ms. Laskowski,

The Pasha Group (Pasha) and Pasha Hawaii respectfully submits this letter requesting that the California Air Resources Board (CARB) make changes to the Low Carbon Fuel Standard (LCFS) that would accelerate participation in the LCFS program and decarbonize the maritime sector.

Pasha owns and operates Pasha Hawaii, one of the nation's leading domestic ocean fleets, serving Hawaii from the continental United States. Two of the newest eight vessels in the fleet are fueled by liquified natural gas (LNG). Pasha Hawaii is a trusted partner for many of the nation's leading retailers, manufacturers, and U.S. government agencies, providing reliable containerized and roll-on/roll-off cargo services that leverage its unique combination of ocean transportation and inland distribution capabilities.

Some key points to note:

- Conventional marine fuels are a large contributor to carbon emissions in California waters and communities.
- Maritime leaders like Pasha have plans to adopt lower carbon alternative energy sources and fuels.
- These plans could accelerate and evolve with additional incentives to put the economics of the investment on parity with vessels using traditional higher carbon fuels.
- CARB's jurisdiction goes beyond the coastline, and all low carbon fuels burned within CARB's jurisdiction should be eligible for LCFS credits. This would incentivize the marine industry to use lower carbon intense energy sources while at anchor and in transit.

Pasha is in the process of responding to a Maritime Administration (MARAD) Maritime Environmental & Technical Assistance (META) RFQ to perform a feasibility study on Future Energy Options for Commercial Harbor Craft Operating in California. If selected by MARAD to perform the META feasibility study, Pasha will team with Vanderbilt University and Cal Maritime to perform the research and analysis. The goal is to provide a useful guide for Commercial Harbor Craft (CHC) operators of future energy options and feasibility of each. Pasha wants to participate in this study as we strive to be the leader in the transition to cleaner energy. As with most new technologies, cost is a barrier that incentive programs, such as the LCFS program, help make the transition to new clean fuel sources more feasible. We hope that the LCFS program is extended to the maritime sector and can be included in the upcoming feasibility study and resulting guide to CHC.

Commercial Harbor Craft

Pasha recommends that CARB expand the eligibility to low-carbon fuels used in CHC as well as shore power. Vessel operators could accelerate deployment of lower carbon fuels to CHC if able to directly benefit from LCFS as the credit generator. CHCs are technically eligible to generate credits in the current program through a Tier 2 EER-adjusted pathway, but this is a complex process that has inhibited CHC participation in the past.

Ocean Going Vessels (OGV)

Pasha recommends that marine fuels used in ocean going vessels be eligible under LCFS. Technology for lower carbon fuels in OGVs are currently feasible (e.g., hydrogen, LNG, biofuels). The LCFS revenue will improve the financial feasibility of shifting to these technologies and drive change by the vessel owners/operators. Since OGVs are expensive compared to most other transportation assets and the upgrades/technology improvements needed to accommodate lower carbon fuels aboard OGVs fall on the vessel owner/operator, we recommend that the credits accrue to the vessel owner/operator.

Additionally, OGVs can sit for days at anchor emitting emissions that are typically carried onshore by winds. There currently are not any incentives to invest and switch to lower emissions fuels while at anchor. During port congestion periods, ships anchored off the coast of California burn around 5-6 metric tons of fuel per day (based on Pasha's ships) in their auxiliary engines. These emissions at anchor plus the emissions of ships in transit could be reduced by switching to cleaner fuels incentivized by the LCFS program.

More specifically, Pasha recommends the below to be included in the LCFS program:

- Inclusion of renewable energy produced onboard CHCs and OGVs. The energy produced would provide the electrical or usable energy form that would normally be produced by the ship's propulsion or auxiliary engines. As a result, the engines will burn less fuel resulting in lower carbon emissions. Since these renewable energy sources vary with environmental conditions, energy storage systems may be required to stabilize the power supply, which can add costs. Energy types include the following:

- Energy produced from wind sources onboard: Pasha is currently evaluating the use of compact energy dense micro wind turbines on top of the bridge wings on some of its ships as a pilot program. These micro wind turbines will always produce green energy when in port, in transit, and at sea for significant carbon savings. This technology is commercially available with cost being the major barrier. The allowance of LCFS credits will recover some of the high initial cost and promote the use of this technology.
- Energy produced using solar panels: Pasha is currently evaluating using solar panels as both an energy producer as well as providing shading. This will result in electrical generation as well as reduced air conditioning cost. While there is limited area available to install solar panels on CHCs and OGVs, every kWh produced by renewable energy onboard is one less kWh produced by the ship's fossil generators. As CHCs and OGVs are subject to very harsh environments, the installation and electrical connection of a marine solar system is more expensive than shore side installations. The allowance of LCFS credits will recover some of the high initial cost which will promote the use of this technology.
- Energy recovery systems: There are new technologies that continue to improve in energy recovery efficiency. A significant portion of energy available in fossil fuels burned in marine engines is converted to heat where it is either discharged to the atmosphere or water. Technologies convert this thermal energy into other useful energy forms such as refrigeration for cooling, compressors, or electricity. All these energy recovery systems reduce the amount of fuel burned by the fossil fuel engines by utilizing more of the available energy in the fuel. The allowance of LCFS credits will recover some of the high initial cost which will promote the use of this technology.
- Inclusion of low carbon fuel sources on OGVs and CHCs: Pasha has experience with bringing new low carbon fuel sources into maritime shipping. This is shown with the recent delivery of our new LNG fueled container ship. The undertaking of building one of the lowest emissions full size container ships was both a technical and financial challenge. These are common barriers to the transition to new low emission fuel sources. Below are the recommended low carbon fuels to be included in the LCFS program to promote their utilization:
 - Liquified Natural Gas:

LNG is considered the transition fuel to an eventual zero emission fuel source. It has significantly lower criteria emissions than traditional fossil fueled engines. While still a new technology, it is becoming more mature as more mariners are being trained in LNG ship operations and availability of shoreside support. LNG is becoming more widely available in California ports. It still, however, has significant cost barriers to OGVs and CHCs in new building and conversion of existing vessels.

- Hydrogen:

Hydrogen made from green energy sources is one of the best options for zero emissions fuels for the maritime industry. While other sources of carbon-based fuels can be considered renewable, they still emit some carbon and other emissions when burned in engines. Green Hydrogen does not create any emissions other than water.

Pasha is currently evaluating green hydrogen project concepts at several ports where we operate. These projects would propose wind or solar powered energy to create green hydrogen adjacent to port operations. Having portside infrastructure like this will help facilitate and encourage the conversion to zero emission equipment, CHCs, and OGVs in the future to support CARB's overall emission reduction goals and mandates. While producing the green hydrogen locally (within the state of California) and converting CHC is technically feasible, cost is still a barrier. LCFS for both the producer of the green hydrogen and the consumer of green hydrogen will promote both the local production and conversion of CHCs and OGVs to use green hydrogen as both have a significant cost. In addition to the zero-emission benefit of green hydrogen, it also adds a significant resiliency aspect as all the resources needed for production of green hydrogen are readily available within the state of California.

- Biofuels:

Biofuels can be a substitute fuel source for traditional and new technology engines to lower emissions. It can possibly be used for the pilot fuel for LNG fuel engines for further emission reduction in LNG ships. The use of these fuels can be incentivized with the LCFS.

- Electrification of CHCs:

Zero emissions CHCs with the use of battery storage is feasible for certain types and operational profiles. Battery storage, cost and available shore charging infrastructure are all barriers of this technology. LCFS credits should be provided in the same manner as shoreside cargo handling equipment that is electrified. This is an easier way to access the LCFS to help make the transition.

Please reach out to us with any questions. We welcome further discussion and with LCFS assistance look forward to deploying and operating cleaner CHCs and OGVs.

Sincerely,



Edward Washburn

Senior Vice President, Fleet Operations