

The Honorable Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

November 8, 2024

Dear Chair Randolph and Board Members,

Thank you for the opportunity to comment on the proposed LCFS regulation. CARB has maintained a leadership position in managing GHG emissions over the decades and the LCFS program. The program has achieved the following:

- Reduces use of petroleum fuels
- Provides incentive for electric and hydrogen vehicle operation and infrastructure
- Launched a methane capture industry from sources that are not easily regulated
- Spawns innovation in dozens of new fuel technologies with applications in the hard to decarbonize aviation sector
- Drives investment in renewable power, EV charging, hydrogen, and many other lower emission industries

As such I urge the board to approve the proposed LCFS amendments as the program has proven successful and will continue to lead the world in GHG mitigation.

My company Life Cycle Associates helps fuel producers navigate the LCFS and other programs. Over the past 15 years I have seen incredible interest in low emission fuel options including battery, energy, storage, renewable, electricity for biorefineries and numerous approaches to decarbonizing aviation fuels. Investments in these technologies would not have occurred absent the LCFS. CARB has developed a unique mechanism as a world leader to promote innovation in fuel production and zero emission transportation. The LCFS regulation has led to improved environmental performance including reduced tailpipe emissions from cars and trucks, the use of renewable energy both fuel production and vehicle operation, control of emissions from dairy operations, and many other parts of the economy.

Over a quarter century ago I worked on methanol fueled cars and buses. CARB initiated many efforts to support and examine the use of methanol as a replacement for petroleum fuels. These efforts include a fuel specification for methanol¹ and a year 2000 study,² which I authored, that quantified the local criteria pollutant and air toxics impacts of many fuels including methanol and electric vehicle charging. As you recall, the threat of methanol ended up being the ideal lever to spur the innovation that resulted in reformulated gasoline.

Here we are 20 years later and methanol provides an opportunity as a low-carbon fuel for marine and other applications. Many production options exist for low carbon methanol including e-fuels, where the energy is derived from renewable hydrogen and waste CO₂ to

¹ <https://ww2.arb.ca.gov/our-work/programs/alternative-fuels/alternative-fuels-methanol>

² https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/past/98-338_1.pdf

produce a synthesis gas consisting of carbon monoxide and hydrogen, which is then converted to methanol. Other sources of syngas include renewable natural gas and biomass residues. Just like aviation, marine transport is a hard to decarbonize sector. Marine voyages require thousands of tons of fuel, and yes, they should be supplemented with advanced wind technology. Nonetheless, thousands of tons of fuel will still be required to complete a marine voyage.

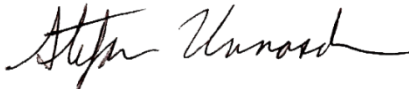
Global marine emissions may not show up in the CARB inventory. However, the particulate emissions from near shore marine vessels are a significant part of the California inventory and contribute to adverse health impacts along the highway 710 corridor where communities are also affected by high levels of truck traffic. Allowing methanol to be considered as an opt-in fuel for marine applications will support the development of low carbon fuel technologies which will result in substantially reduced particulate emissions and air toxics.

I urge the board direct CARB staff to include methanol as a fuel for marine applications.

Thank you for your consideration.

Stefan Unnasch
Managing Director
Life Cycle Associates

Best Regards,



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Life Cycle Associates, LLC