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Comments to Proposed Low Carbon Fuel Standard Amendments

Umwelt Energy ApS ("**Umwelt Energy**") appreciates the opportunity to provide feedback on the California Air Resources Board's ("**CARB**") proposed amendments to the Low Carbon Fuel Standard ("**LCFS**") regulation.

As detailed below, our comments pertain to Section 95482(d)(2) of the current LCFS regulation, which exempts ocean-going vessels from the LCFS.

In particular, these comments propose the basis for revisions to the regulatory text, so fuels for ocean-going vessels — as a minimum — are treated the same way as aviation fuels.

We believe revisions are warranted, as they would significantly incentivize the scale-up of Californian low-carbon fuels, which are regarded as the most promising pathway to decarbonize the maritime sector, a significant (indirect) contributor to California's emissions.

Umwelt respectfully requests that CARB include these proposed revisions in its forthcoming LCFS amendments.



➤ Background: Umwelt Energy

Umwelt Energy develops industrial-scale e-fuel projects in green industrial hubs that further the green energy transition by enabling deep decarbonization of hard-to-abate industries. We believe that addressing emissions from all sectors, including maritime shipping, is crucial to achieving California's ambitious climate goals.

Our projects combine renewable power generation, the production of green hydrogen via electrolysis, and e-fuel synthesis plants. Using proven technologies that can operate flexibly on-grid or off-grid, the e-fuels we produce include green methanol, ammonia, and kerosene, with off-takers primarily in the maritime and aviation sectors. In addition to serving as feedstock for e-fuels, our projects can help local communities by decarbonizing heavy Californian industry like the glass, steel, and cement¹, which are major contributors to in-state greenhouse gas ("GHG") emissions. Hence not only do our projects reduce emissions directly in California, but they also reduce California's GHG footprint outside the state.

➤ California as World-Leading on Climate actions

Umwelt Energy currently have projects in different stages of development in the US, with several projects specifically located in California. However, regulatory hurdles, including limitations within the LCFS, hinder our ability to contribute fully to the state's ambitious climate goals.

A critical shortcoming is the current exemption for ocean-going vessels from the LCFS. This exclusion undermines California's potential for comprehensive GHG reduction, considering the global shipping industry's 2-3% share of global emissions². As California ascends to become the world's fourth-largest economy while simultaneously claiming the "*most ambitious set of climate goals*

¹ California's seven cement plants are major contributors to the state's greenhouse gas emissions, spewing out 7.8 million metric tons of carbon dioxide equivalent in 2019 alone. This accounts for a staggering 8.8% of all industrial sector emissions, highlighting the urgent need for cleaner alternatives in this critical industry (<https://ww2.arb.ca.gov/events/second-workshop-sb-596-cement-sector-net-zero-emissions-strategy#:~:text=The%20seven%20cement%20plants%20currently,sector%20GHG%20emissions%20in%20California.>)

² <https://www.globalmaritimeforum.org/getting-to-zero-coalition>

*of any jurisdiction in the world*³ this inconsistency becomes particularly glaring.

Thousands of ships traverse the world's oceans, transporting goods to and from California, virtually all reliant on fossil fuels that generate significant GHG emissions. Overlooking these emissions, with their undeniable Californian footprint, is counterproductive. While the latest LCFS amendment addresses important areas, it fails to consider this major contributor to the state's climate challenge.

Therefore, we urge CARB to include ocean-going vessels within the LCFS scope. This crucial step would not only align with the state's climate goals but also incentivize the adoption of clean e-fuels in the maritime sector, ultimately contributing to a cleaner future for California and beyond.

➤ Low Carbon Fuels for the Maritime Sector

Ocean-going vessels are undeniable contributors to climate change and local air quality concerns, not just through their 2-3% share of global GHG emissions, but also by spewing significant air pollutants. While geographically, much of this occurs outside California's immediate jurisdiction, the impacts of climate change and degraded air quality transcend borders, significantly affecting the state.

Including ocean-going vessels within the LCFS presents a unique opportunity to leverage California's leadership role in environmental progress. Such a bold move would not only address a significant source of emissions directly linked to California's economy and environment, but also set a powerful precedent for stricter regulations on a global scale. This precedent could pave the way for the wider adoption of cleaner technologies and practices, driving meaningful change in a problem with undeniable global implications.

Furthermore, incorporating ocean-going vessels into the LCFS aligns with the rising tides of stricter regulations being implemented by both the European Union (EU) and the International Maritime Organization (IMO). By taking this step,

³ <https://ww2.arb.ca.gov/news/california-releases-final-2022-climate-scoping-plan-proposal>

California would not only be leading by example but also aligning itself with the progressive efforts of these influential bodies, potentially accelerating the pace of positive change in the maritime sector.

As an example, bio-methanol and e-methanol hold significant potential as future shipping fuels. They have emerged as a major pathway for achieving maritime decarbonization goals and offer one of the most promising solutions for reducing emissions in the marine industry.

Methanol is an organic chemical used in various products and as a fuel. When burned, it produces lower amounts of CO₂, particulate matter, and sulfur emissions compared to heavy fuel oil (“**HFO**”) or marine gas oil (“**MGO**”). Naturally, CO₂ is emitted as well in the process (1.4 kilograms per kilogram of methanol versus 3.1 kilograms per kilogram of fuel oil⁴). However, as the bio-methanol and e-methanol is produced from captured biogenic or unavoidable CO₂, and for e-methanol, combined with green hydrogen generated from renewable electricity sources, these fuels ultimately represent carbon-neutral fuels.

Leading shipping companies, including A.P. Møller-Maersk, CMA CGM, COSCO, Methanex Waterfront Shipping, and Stena, have already chosen marine methanol as the near-term low carbon future fuel⁵. Therefore, California also needs to support the immediate development of a greener future for the maritime sector by making these low-carbon intensity fuels available at a competitive price. This can be achieved by including ocean-going vessels in the LCFS program.

Additionally, deploying bio-methanol and e-methanol as a marine fuel dramatically lowers emissions of sulfur oxides, nitrogen oxides, and particulate matter compared to HFO or MGO.

- Leveraging the Amendment to the Intrastate Aviation Fuel Precedent

⁴ <https://www.man-es.com/discover/methanol-fueled-ships>

⁵ https://www.methanol.org/wp-content/uploads/2023/05/Marine_Methanol_Report_Methanol_Institute_May_2023.pdf

The proposed amendment to include intrastate sustainable aviation fuel (“**SAF**”) in the LCFS sets a crucial precedent for holding all transportation sectors accountable for emissions reduction. Exempting ocean-going vessels creates an inconsistency that undermines California's leadership in environmental action and sends a message of unequal treatment of GHG emitters.

Expanding the LCFS to encompass – as a bare minimum - intrastate marine fuels for ocean-going vessels demonstrates policy coherence and continuity. It builds upon the established framework for regulating intrastate fuel sources and sends a clear message of comprehensive decarbonization efforts across all transportation modes.

In addition, the 2028 start date for SAF LCFS regulation reflects anticipation of technological advancements and infrastructure development for cleaner fuels. Similarly, including ocean-going vessels in the LCFS incentivizes investments in low-carbon intensity fuel production and infrastructure, is aligned with expected advancements in the timeframe of technological advancements for low-carbon marine fuels.

- Benefit of including ocean-going vessels to section 95482(d)(2)

Incentives created by including ocean-going vessels to the LCFS could spur the development and adoption of clean technologies like bio-methanol and e-methanol, generating economic opportunities across the state of California. This shift away from fossil fuels wouldn't just benefit the environment, but also enhance the competitiveness of Californian fuel infrastructure, ports and shipping companies through their leadership in sustainability.

In addition, including ocean-going vessels in the LCFS creates a fair environment for players who invest in green technologies. Companies choosing cleaner fuels would gain a competitive edge in the global market, accelerating the transition towards a sustainable maritime industry, which ultimately reduce the climate impact on California.

We must also address, that communities living near Californian ports and heavy industries suffer disproportionately from air pollution. By including ocean-going vessels in the LCFS, California can demonstrate its commitment to environmental justice, ensuring all communities benefit from cleaner air and a healthier environment.

As the world's fourth-largest economy with ambitious climate goals, California has a unique responsibility to address its maritime emissions. A phased approach starting with vessels operating within Californian waters can lay the groundwork for broader inclusion.

➤ Final Remarks

California can cement its global leadership in climate action by including ocean-going vessels in the LCFS. This bold step would not only address a significant source of emissions directly linked to the state, but also set a powerful precedent for stricter regulations, incentivize clean technologies, and ultimately contribute to a cleaner future for California.

- Align with ambitious climate goals: Including ocean-going vessels in LCFS aligns with California's commitment to tackling all sectors contributing to emissions.
- Leverage California's economic power: Incentivize investments in low-carbon fuels like bio-methanol and e-methanol, generating economic opportunities across the state and strengthening the competitiveness of California.
- Level the playing field: Create a fair environment for players who invest in clean technologies, accelerating the transition towards a sustainable maritime industry with tangible benefits for California's climate impact.
- Address environmental justice concerns: Protect communities disproportionately impacted by air pollution from ocean-going vessels and demonstrate California's commitment to environmental justice and ensuring cleaner air for all.
- Build upon existing framework: Leverage the precedent set by including amendments to intrastate SAF in the LCFS, demonstrating policy coherence and continuity toward comprehensive decarbonization.

Umwelt Energy stands ready to contribute to this critical initiative by developing low-carbon e-fuels projects for the maritime sector. We urge CARB to seize this opportunity to make a meaningful impact on California's future by including ocean-going vessels in the LCFS.

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Thank you for your consideration of our comments. Please do not hesitate to contact me Lasse Moelgaard-Nielsen (las@umwelt.energy), if you have any questions.

I want to stress in closing that we would be pleased to meet or otherwise engage with your staff on any aspect of our comments.

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