

August 23, 2024

Chair Randolph and Members of the Board California Air Resources Board 1001 I Street, Sacramento, California 95814 Via Electronic submittal

## **Re: Proposed Low Carbon Fuel Standard Amendments**

Dear Chair Randolph and Members of the Board:

On behalf of Pacific Environment, thank you to the California Air Resources Board (CARB) for soliciting stakeholder input on the potential changes to the California Low Carbon Fuel Standard (LCFS) and for all the hard work that went into it.

Pacific Environment is a 501(c)(3) public-benefit corporation, headquartered in San Francisco, with regional offices in Anchorage, Alaska, and Chongqing, China. Pacific Environment has earned rare permanent consultative status at the International Maritime Organization (IMO), the United Nations' entity that sets international shipping law. At the IMO, Pacific Environment has played a lead role in advocating for a new international regulatory regime (called the "Polar Code") to regulate ship traffic, pollutant emissions, and waste dumping in Arctic waters.

Pacific Environment appreciates the opportunity to comment on the proposed LCFS Amendments. In our full comments below, we address 3 points as outlined here:

- 1) The need for a subsequent immediate opening of another LCFS revision process, unrestricted in scope to proactively address revisions needed as the program matures;
- 2) Time limits for indirect accounting of electrolytic hydrogen to quarterly time periods to ensure low-CI standards are met and emissions are not induced by hydrogen generation during peak demand periods; and
- 3) The need for a rapid review and update of the OPGEE model to account for unique characteristics and impacts of Alaska North Slope oil exports.

## Begin Another Period of LCFS Rulemaking with no Restrictions on Scope

Pacific Environment urges CARB to open another period of rulemaking immediately at the close of the current revisions period. The length of time needed to address this round of revisions and the number of comment letters submitted indicate the high level of interest across stakeholders with a diverse range of opinions and analyses to discuss.

A number of topics were unable to be fully addressed in this round of revisions. Creating a protocol of frequent revisions will allow for greater attention to any remaining unresolved issues and any future ones that may arise as the program continues to grow.

In addition, Pacific Environment urges CARB staff and Board to include marine fuel eligibility within the next round of LCFS revisions. Marine fuel remains a highly polluting source within California waters and air basins, harming numerous environmental justice communities across the state and contributing to nonattainment of federal air quality standards. In addition, the industry is slow to adopt and develop low-carbon intensity (CI) and zero criteria air pollutant fuels and technologies without clear regulatory support and frameworks in place.

Inclusion of marine fuels within the LCFS would provide important support to a developing industry of low-CI fuels and provide needed relief to California communities statewide.

## <u>Limit Book-and-Claim Accounting to Quarterly and Move towards Hourly for</u> <u>Electrolytic Hydrogen</u>

The revised 15-day Amendments released by CARB move to allow indirect accounting for Low-CI Hydrogen through book-and-claim methods across 3 quarters for reporting periods. Pacific Environment urges CARB staff to limit accounting periods for low-CI electricity used to produce low-CI hydrogen to the same quarter time period for reporting. Allowing use across 3 quarters would permit hydrogen produced during peak demand periods with the highest CI score to claim low-CI and a highly coveted sustainability score completely disconnected from the reality of emissions generated due to the electricity demand in producing hydrogen.

Green hydrogen is a promising solution for decarbonizing hard-to-abate sectors, like ocean shipping, if done appropriately. The federal government and recent academic research indicate that hourly matching is the gold standard to ensure power drawn from the electricity grid used to generate hydrogen as a transportation fuel does not increase demand during high emissions generating periods.

A time limit of 3 quarters might be reasonable for direct electrification of transportation end uses given the efficiencies gained and the increased deployment of renewable energy within the grid. But that same time period is not appropriate for electrolytic hydrogen given the much larger energy demands to generate the equivalent amount of energy for transportation use. Electrolytic power demand for hydrogen production could far outstrip the existing and projected increases in renewable energy to serve the grid, increase emissions from greater reliance on fossil fuel plants, and further extend the lifetime of fossil fuel plants used to serve the grid in periods of high power demand.

Unless there is a time period set for a transition to one-quarter or even more granular time periods, there is a risk of investment signals to be sent for increased hydrogen production in the state that places greater demands on the electric system during a time of strong load growth and difficulty matching the pace of development through renewable energy generation.

The LCFS guidance on book-and-claim accounting already has provisions for deliverability and additionality of low-CI electricity, but time matching through limiting quarters available for credit use and retirement remains a critical and unaddressed part of the LCFS revisions. We urge CARB to adopt best practices and signal intent to limit credit matching to one quarter and progressively shorter time periods to hourly in 2028 as the federal government has set.

The three pillars requirements of incrementality, temporal matching, and deliverability will build a robust hydrogen industry that is truly clean and lasts beyond the expiration of 45V. These requirements will ensure the buildout of a durable hydrogen industry that fulfills 45V's goal of reducing carbon emissions and accelerating the clean energy transition.

# **<u>Cleaning California Oil Imports to Do No Harm</u>**

Pacific Environment offers the following comments on the revised **Oil Production Greenhouse Gas Emission Estimator (OPGEE) Model** and data inputs released Feb. 21, 2023:

- 1. CARB should accelerate the adoption of the more robust Version 3.0b of the OPGEE model released Feb. 21, 2023.
- 2. CARB should implement a **rapid review/update process** to update CARB reporting from OPGEE data/modeling to reflect field specific contemporary peer review literature as it becomes available.
  - a. "Climate justice delayed is climate justice denied." Accurate and current data of the emissions is critical to understanding the nature and extent of the climate challenge. In 1954 oil companies knew that what they were doing had an adverse impact on the climate.<sup>1</sup> Their failure to disclose the nature and extent of their knowledge of those impacts is an indictment of their self interest in preserving profits despite horrific impacts on people and the environment. CARB has a responsibility to use timely, accurate data.
  - b. CARB should strive to "level the playing field" among oil producers and accelerate the reporting of field specific clean energy resources to encourage energy developers to strive for lower life cycle emissions.

<sup>&</sup>lt;sup>1</sup> <u>https://www.desmog.com/2024/01/30/fossil-fuel-industry-sponsored-climate-science-1954-keeling-api-wspa/</u>

- 3. CARB should support OPGEE model **data updates** to **reflect the unique challenges of Arctic oil and gas development** highlighted in the peer review literature, including:
  - a. Exploration & Development (§6.1 to §6.2.2.3)
    - i. CARB should allocate the GHG emissions estimates associated with **unsuccessful exploration activities** at the field level. If the emissions estimate from unsuccessful exploration activities cannot be directly assigned to a producing field, the CARB should assign those emissions to regional or national oil producing provinces. For example, Shell conducted and abandoned exploration activities in Alaska's Chukchi Sea. The emissions associated with those activities could be assigned to Alaska's North Slope, Alaska as a whole, or the U.S.
    - ii. CARB should task the OPGEE team with conducting a peer review literature for Alaska North Slope land use impacts related to tundra disturbances and acceleration of melting permafrost and associated methane/biogenic carbon emissions.
    - iii. CARB should task the OPGEE team to review field drilling and development data for Alaska's North Slope field data in OPGEE data tables to verify:
      - 1. that the drilling energy consumption estimates reflect the **high level of** energy consumption required to drill through typically thick permafrost strata.
      - 2. that the **well completion activities** associated with working in **thick permafrost** are reflected in the emissions estimates.
      - 3. that the **field development emissions** data adequately include the **risk of gas leakage around inadequately completed and monitored wells** [CD-1 Pad, Alpine Field, Alaska North Slope, March 4, 2022]
      - 4. that the hydraulic fracturing energy consumption and associated emissions estimates reflect the higher level of energy consumption required in the typically lower temperature North Slope oil producing strata near thick permafrost strata, especially for viscous and heavy oil prospects that are being developed at shallower depths.
      - 5. that the energy expenditures and GHG emissions that arise from the extraordinary surface use activities necessary to protect the fragile tundra ecosystem, e.g., snow/ice roads, are adequately reflected in emissions estimates.
      - 6. that the GHG emissions associated with surface disturbances of highly thermally sensitive tundra which leave trails in the tundra which accumulate surface water which in turn absorb heat during the increasingly warming climate and accelerate the thermal degradation of permafrost which in turn releases high concentrations of methane are adequately reflected.
  - b. Production (§6.4 through §6.53)
    - i. CARB should task the OPGEE team with reviewing the data associated with the use of **miscible injectant** (CH4, CO2 mixture) for **enhanced oil recovery**

on Alaska's North Slope to verify that the data adequately accounts for CH4 and CO2 leakages.

- ii. CARB should task the OPGEE team with reviewing the data associated with the use of polymer flooding for enhanced oil recovery of viscous and heavy oils on Alaska's North Slope to verify that the data adequately accounts for the life cycle emissions of those activities to produce viscous and heavy oils.
- c. Fuel Cycle & Embodied Emissions (§7)
  - i. CARB should task the OPGEE team with reviewing and verifying the assumptions underlying the co-production credit for prospective LNG exports from Alaska, i.e., the "natural gas displaces coal" vs. "natural gas could be substantially displaced by renewables." Verify the estimates for the magnitude and direction of the savings/cost of natural gas vs. coal supply chains, especially considering the energy intensive LNG supply chain associated with Alaska's North Slope natural gas, either an 800-mile pipeline + LNG or arctic ice breaking LNG tankers. We note that commentary research on coal v. natural gas supply chains suggests that any LNG advantage evaporates with more rigorous analysis.<sup>2</sup> Adding an 800-mile pipeline clearly disadvantages that supply chain compared to a local coal supply.
  - ii. CARB should task the OPGEE team with reviewing and verifying the OPGEE model and field specific data to ascertain the extent to which GHG emissions associated with the long energy intensive supply chain for mobilization, transport and storage of equipment and materials associated with Alaska's North Slope are taken into account. In addition, subsequent GHG emissions associated with landfilling and recycling materials from Alaska's North Slope including the emissions associated with dismantlement, removal and restoration fossil fuel lease obligations should be included in the embodied emissions accounting or a separate category.
- d. Venting, Global Warming Potential & Fugitive Emissions (§8, §9.1, §10.2.3.1)
  - i. CARB should task the OPGEE team with reviewing and incorporating contemporary flaring emissions data **by field** instead of **country** to more accurately reflect highly variable CH4 emissions. See for example the date within OCI+ (Oil Climate Index + Gas)<sup>3</sup>.
  - ii. CARB should **adopt the 20-year Global Warming Potential (GWP) for** CH4 as the default and require OPGEE to adopt the 20-year GWP for CH4.
- 4. CARB should require the OPGEE team to **divest itself of funding sources that create the appearance of conflict of interest,** e.g., Aramco and Chevron.

<sup>&</sup>lt;sup>2</sup> See for example the working paper of Robert Warren Howarth, "The Greenhouse Gas Footprint of Liquefied Natural Gas (LNG) Exported from the United States," Department of Ecology & Evolutionary Biology, Cornell University, Ithaca, NY 14853 USA. In review at a peer-reviewed journal; Submitted October 24, 2023; Revised January 13, 2024; Subject to further revision before publication as a peer-reviewed article.

<sup>&</sup>lt;sup>3</sup> See the OCI+ methodology page, which includes a description of the flaring emissions data developed by a team that includes members from the Colorado School of Mines. <u>https://ociplus.rmi.org/methodology#opgee</u>

- 5. CARB should avoid the trap of only updating the data in the OPGEE model when ALL fields have ALL data input fields updated with field-specific data as this will create a perverse incentive for dirty oil producers to refrain from reporting field-specific data while cleaner oils fail to get credit for cleaner field-specific data skewing comparisons between fields as well as underestimating aggregate emissions.
- 6. CARB should **independently audit and verify data provided by the field operators** to ensure reliable reporting of the data that drives emissions estimates.

Thank you for your consideration of these comments. We would welcome the opportunity to discuss them with respective staff, and we look forward to continued participation and discussion to further strengthen the LCFS.

Sincerely,

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CC: Steve Cliff Members of the Board