

PROMETHEUS

June 21, 2022

Via Electronic Submission

Rajinder Sahota
Deputy Executive Officer – Climate Change & Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Notice of Public Meeting to Consider the Draft 2022 Climate Change Scoping Plan
https://www.arb.ca.gov/lispub/comm/iframe_bcsbform.php?listname=scopingplan2022&comm_period=N

Dear Ms. Sahota:

Prometheus Fuels, Inc. (Prometheus) writes in response to the Draft 2022 Scoping Plan Update (Scoping Plan) recently released by the California Air Resources Board (CARB). We endorse California's environmental goals and are committed to helping CARB achieve them. Prometheus offers the following comments regarding the Scoping Plan, and we appreciate the opportunity to do so.

I. Prometheus is an Electrofuels Company.

Prometheus is a California-based company that uses direct-air-capture (DAC) technology and renewable energy (e.g., solar, wind) to manufacture zero net carbon and zero carbon CARB hydrogen and drop-in sustainable aviation fuel, gasoline, and diesel fuel. Our suite of fuels is also known as electrofuels. The only inputs to our fuel-production process are air and renewable electricity and the only outputs are fuel and oxygen. More information about our company is available at www.prometheusfuels.com.

Prometheus makes its zero net carbon electrofuels using a novel, proprietary process that operates on the principle of reverse combustion. It does this in modular, containerized systems called Fuel Forges. Each modular container has the capacity to produce 100,000 gallons of liquid fuel and 100,000 kilograms of hydrogen per year.

First, a Fuel Forge captures carbon dioxide (CO₂) and water (H₂O) from the air. Second, the Forge uses renewable electricity to turn the CO₂ and H₂O into long-chain alcohol fuels and hydrogen via electrocatalysis. During this second step, oxygen is released, acting as a kind of mechanical forest, adding 1.3 million kilograms of oxygen to the air, or roughly the same amount of oxygen emitted by 127 acres of forest.¹ Third, the Forge separates the alcohol fuels from the remaining H₂O. In

¹ The forest equivalent refers to old-growth oak forest and is based on an approximate value determined by Timothy J. Fahey, professor of ecology in the department of natural resources at Cornell University. See C. Claiborne Ray,

the final step, a catalyst turns the alcohol fuels into hydrocarbons and recovers water. This step can be customized to produce gasoline, diesel, or jet fuel. The proprietary catalysts Prometheus uses are licensed from U.S. National Laboratories, representing decades of successful national renewable energy research.

Unlike other companies that employ direct air capture of CO₂, Prometheus does not use any fossil-fuel energy to make its products, and does not contribute to or sustain business-as-usual fossil fuel use. Prometheus's electrofuel production also has no impact on the food supply, as it does not compete with land use for agriculture and does not use food stocks like corn or vegetable oils. Prometheus's manufacturing process is designed to yield no waste, and to not add any new carbon emissions into the atmosphere.²

II. The Scoping Plan Can do More to Identify the Benefits of Carbon Utilization.

The Scoping Plan describes California's goal as being to achieve carbon neutrality by 2045 or earlier, and indicates that the Plan aims to "shatter the status quo."³ In addition, the Scoping Plan recognizes that internal combustion engine vehicles "will remain on the road for some time, even after all new vehicles sales have transitioned to [zero emission vehicle] technology."⁴ CARB writes that "the state must continue to support low-carbon liquid fuels during this period of transition and for much harder sectors for ZEV technology."⁵ Prometheus agrees with CARB's assessment.

Prometheus is well-positioned to help California decarbonize transportation by replacing fossil-based transportation fuels with Prometheus zero net carbon electrofuels. A 2021 techno-economic analysis and lifecycle assessment of the Prometheus process done by Ramboll, a well-respected engineering firm in the fuels space, shows that our energy efficiency is high – with a carbon intensity score close to zero – and conservatively estimates that our cost to capture carbon is \$36 per ton.⁶ The Ramboll report also confirmed the maturity of Prometheus's technology and its ability to deliver carbon-neutral fuel at a price that competes with legacy fossil fuels.⁷ In addition, our fuel requires no modifications to existing engines, has no blend limits, and burns cleaner than fossil fuels. Our fuel requires no new vehicle purchases. Thus, our fuel will be available to every community that utilizes transportation.

Aside from decarbonizing transportation, the Scoping Plan also focuses on the feedstocks that go into making those drop-in replacement fuels. According to CARB, "California must use the best

Tree Power, THE NEW YORK TIMES (Dec. 3, 2012), <https://www.nytimes.com/2012/12/04/science/how-many-pounds-of-carbon-dioxide-does-our-forest-absorb.html>.

² *Compare with* Letter from Environmental Justice Community to Administrator Michael Regan: Implementation of the Renewable Fuel Standard e-RINs for wood biomass, landfill gas, and factory farm gas, (May 25, 2021) (identifying that "[i]mpacted frontline communities already bear the disproportionate brunt of harm from the processing and burning of woody biomass, factory farm gas, and landfill gas."), <http://foe.org/wp-content/uploads/2021/05/No-e-RINs-for-Biomass-Landfill-Gas-or-Factory-Farm-Gas-Letter-final-2.pdf>.

³ CARB Draft 2022 Scoping Plan, p. 0-1.

⁴ CARB Draft 2022 Scoping Plan, p. 152.

⁵ CARB Draft 2022 Scoping Plan, p. 152.

⁶ <https://prometheusfuels.com/news/3rd-party-techno-economic-analysis>.

⁷ <https://prometheusfuels.com/news/3rd-party-techno-economic-analysis>.

available science to ensure that raw materials used to produce transportation fuels do not incentivize feedstocks with little to no GHG reductions from a life cycle perspective.”⁸ Again, Prometheus agrees, and is well-positioned to assist. As described above, the only inputs to Prometheus electrofuels are air and renewable energy. As a result, Prometheus manufacturing would help California reach the GHG reductions it is looking to achieve. In addition, depending on where Prometheus manufactures its electrofuels, emissions could be reduced in communities where much of the fossil extraction and refining industries currently are located, leading to a reduction in the deleterious health effects of air pollution.

In addition to the ways Prometheus can help California achieve its climate goals, Prometheus notes that the Scoping Plan can do more to highlight the benefits of carbon utilization. Regarding DAC technology, the Scoping Plan focuses mostly on carbon removal and sequestration. Prometheus notes that burying CO₂ underground has no economic value and cannot lead to broader consumer adoption of renewable fuel over fossil fuel. Rather, the Prometheus model of utilizing the captured CO₂ to create a cost-competitive alternative to fossil fuel can lead to broader consumer adoption of a fossil alternative.

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Prometheus reiterates its support for CARB’s work to consider the solutions identified in the Scoping Plan. CARB calls on private industry to take an active role in helping the world’s fifth largest economy move forward on its path to carbon neutrality. Prometheus is responding to that call and looks to accelerate the state’s transition to zero net carbon alternatives to fossil fuel. We would welcome additional discussion with the team working on these important issues. Thank you for your consideration.

Sincerely,

Rob McGinnis, PhD
Founder, CEO
Prometheus Fuels, Inc.
prometheusfuels.com

⁸ CARB Draft 2022 Scoping Plan, p. 153-154.