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

Comments submitted electronically

RE: Comments Related to the August 18th Low Carbon Fuel Standard Workshop

Dear Dr. Laskowski,

Air Products is pleased to provide comments in support of the California Air Resources Board (CARB) planned rulemaking for the Low Carbon Fuel Standard (LCFS). We support California's climate goals and believe that Air Products can help California with the energy transition needed to meet these challenges. Hydrogen will play a key role in the energy transition, and it is important that the LCFS provide the necessary and appropriate technology-neutral framework to incentivize hydrogen decarbonization to assist in this transition.

Air Products is the only U.S.-based global industrial gas company and the world's largest hydrogen producer and supplier for use in numerous markets, including transportation. We are committed to rapidly scaling and decarbonizing global hydrogen supplies to support decarbonization efforts internationally. On July 25th, 2022, Air Products announced[1] that it will spend or commit at least $4 billion in additional new capital for the transition to clean energy over the next five years. In the two years proceeding this announcement, Air Products had announced approximately $11 billion in clean energy investments, including:

- A multi-billion-dollar project which will be the world's largest green hydrogen project by far, requiring more electrolyzer capacity than has been deployed throughout the world to date. This project alone will serve to scale global electrolyzer production capacity and manufacturing, helping to bring down the costs of this important technology.

- An innovative $1.6 billion net-zero carbon hydrogen production complex in Alberta, Canada, which achieves net-zero emissions through the combination of advanced hydrogen reforming technology, carbon capture and storage, and hydrogen-fueled electricity generation. Air Products recently won the Best Carbon Management Initiative Award for this project at the 2021 *Chemical Week* Sustainability Awards.

[1] Air Products Announces Additional "Third by '30" CO2 Emissions Reduction Goal, Commitment to Net Zero by 2050, and Increase in New Capital for Energy Transition to $15 Billion

- A $4.5 billion blue hydrogen clean energy complex in Louisiana, which represents the company's largest investment ever in the United States and will sequester more than 5 million tons of carbon dioxide (CO_2) per year. This project will capture 95% of the facility's CO_2 emissions and produce blue hydrogen with near-zero carbon emissions.

- A green hydrogen facility based in Casa Grande, Arizona just outside Phoenix which is expected to be onstream in 2023 and will produce zero-carbon liquid hydrogen for the transportation market.

- A $2 billion major expansion project with World Energy to develop North America's largest sustainable aviation fuel production facility in Paramount, California. The project will expand the site's total fuel capacity to 340 million gallons annually, and among other investments, includes an extension and capacity increase of Air Products' existing hydrogen pipeline network in Southern California. The project is scheduled to be onstream in 2025.

Tier 1 Simplified Calculator for Hydrogen

As stated at the workshop, we are very supportive of CARB advancing a tier 1 simplified calculator for hydrogen. Having such a tool will help streamline carbon intensity (CI) calculations for hydrogen that is necessary to support the growth of this important energy resource to meet California's decarbonization goals. Based on what was presented at the workshop, we ask that CARB not limit the calculator to only steam methane reforming and electrolyzer-based hydrogen production. Since the calculator is only periodically updated, we ask that CARB provide as many pathway configuration options initially as possible. Some examples include Auto-Thermal Reforming, Partial Oxidation, and pathways that reflect ammonia's potential as a carrier for hydrogen. Many of these pathways are already addressed in the GREET lifecycle emissions model, so these options should not be burdensome to adapt to the calculator. Air Products is ready to work with CARB to design these additional configuration options into the calculator tool.

Carbon Intensity (CI) Credit True-Up

Air Products supports CARB's proposal to provide a carbon intensity true-up for the difference in credits between temporary pathway carbon intensity values and the final approved fuel pathway CI value. We also support the concept that was proposed by other advocates to enable an annual credit true-up for reported and verified CI values that are better than the certified fuel-pathway value. These credits should be deposited in the entity's compliance account and not to a general buffer account managed by CARB. Such a true-up will help entities realize the full value of the carbon intensity of their fuels while still enabling a certified pathway value with suitable contingency to ensure compliance. In fact, we think this will encourage optimization and continuous improvements to lower carbon intensity and provide superior emission reduction outcomes.

GREET Model Updates

CARB staff is considering updates to emission factors in the GREET model and simplified calculators. Air Products is supportive of such updates – especially updates that reflect the current electricity grid mix as California's electricity sources decarbonize over time. It is important for all hydrogen production technologies - as well as energy demand throughout the hydrogen supply chain - that updated data be used so that the carbon intensity calculations for pathways are accurate and reflective of the overall lowering of emissions. In addition to California, updated emission factors for electricity should be used throughout the United States as many regions are undertaking initiatives to decarbonize their electricity grids. Moreover, Air Products recommends that there be language provisions adopted that enable key GREET factors, like electricity carbon intensity, to be updated annually – outside of the formal rulemaking process. This could be done perhaps via an executive officer approval process, with public input.

We also support incorporation of the latest Argonne National Lab GREET model as there have been important updates to factors related to hydrogen supply chains since the current 2016 version of the model used by CARB. These updates impact energy efficiency factors, methane leakage factors, and production of green ammonia.

FCEV Fuel Transaction Verification

Air Products is supportive of the increased verification requirements, including for Fuel Cell Electric Vehicle (FCEV) fueling transactions proposed by CARB beyond the current requirements for those transactions involving biomethane book and claim accounting (95500(c)(1)(D)). We believe that robust verification is critical to ensuring that the LCFS program achieves the quantified reductions and provides a level playing field for all market participants.

Technological Neutrality

During the workshop, there was a suggestion by a commenter that only hydrogen derived from renewable power with electrolysis be credited in the program. This suggestion misunderstands the design of the LCFS and undermines one of the most important and transferrable hallmarks of the program – performance-based technological neutrality. The LCFS enables all technologies to compete on a carbon intensity basis – without picking specific winners and losers. This enables both new technologies and improvements to existing technologies to emerge and compete in a credit market against increasingly stringent performance standards. Incentivizing emission reductions without inherent bias is the most effective path forward to decarbonize the transportation sector. We urge CARB to continue its support of this critical construct and retain the technological neutrality inherent in the LCFS.

Follow-up Comments on the Expansion of Hydrogen Refueling Infrastructure Credits to Medium and Heavy-Duty Vehicles

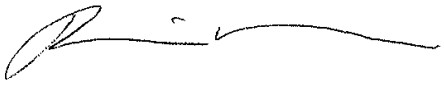
As we have said in past letters, we are pleased that CARB is proposing the expansion of hydrogen refueling infrastructure (HRI) credits to stations serving medium and heavy-duty vehicles (MHD). Air Products strongly supports this expansion.

- We continue to support the proposed MHD HRI credit cap at 2.5% of the previous quarter deficits, and that this credit cap of 2.5% must be in addition to the LDV HRI cap of 2.5% and stations offering both should have a combined cap of 5%. We understand that CARB is concerned that the concept of allowing a cap of 5% for HRI credits, in addition to a 5% cap for electric vehicle (EV) charging credits, could enable too many of these credits to enter the market at a combined cap of 10%. To remedy this, we suggest that you eliminate or curtail the 2.5% allocated for light-duty vehicle charging. Electricity-based credits significantly out pace hydrogen-derived credits in the program despite only 1 % of them being from EV charging credits. Based on the level of support that non-capacity-based crediting affords electricity in the regulation, along with many other policy supports and incentives for charging infrastructure in California, providing charging credits for the established light-duty battery-electric market was, and is not needed. If this crediting is eliminated, this would reduce the cap for both EV charging and HRI credits to 7.5% (5% combined for HRI of all vehicle classes, and 2.5% for MHD vehicle charging infrastructure).

- As we stated in our previous comment letter, the HDV HRI pathways application deadline in 95486.2 (a)(1)(B) needs to extend to December 2030. After further review, we also believe that the application deadline for light-duty HRI crediting should extend to 2030. Our understanding is that HRI credit applications to date have overwhelmingly been submitted by hydrogen station developers that have been awarded California Energy Commission (CEC) grant funding to build out the hydrogen refueling station network. A successful market-based program such as the LCFS should ideally encourage greater industry participation from a wider number of companies and therefore should be extended to allow for other industry players to benefit. With delays in development and commissioning of CEC-funded stations in California even prior to the Covid-19 pandemic, the resulting impact on global supply chains has and will continue to cause unforeseen delays in hydrogen station development for some time. For these reasons, we strongly recommend extending the HRI application deadline. We believe doing so will continue to help the industry without adversely impacting the overall LCFS program.

Air Products appreciates the opportunity to provide this feedback and we would be happy to meet with CARB to discuss further or work through draft language. Please feel free to contact me by phone (916-860-9378) or email hellermt@airproducts.com.

Respectfully,



Miles Heller
Director, Greenhouse Gas Government Policy