**Air Products and Chemicals, Inc.**
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Telephone (610) 481-4911

27 August 2008

Mr. John Courtis
California Air Resources Board
1001 I Street
Sacramento, CA 95814-5512

Re: California Low Carbon Fuel Standard – Lifecycle analysis

Dear Mr. Courtis:

On behalf of Air Products and Chemicals, Inc. the Hydrogen Energy Systems group is pleased to provide comment on the proposed California Low Carbon Fuel Standard (LCFS) regulation as it pertains to lifecycle analysis considerations.

In review of proposed LCFS regulations the vehicle efficiency adjustment factor presented in Table 5.2.2 requires further consideration in regards to Hydrogen light-duty (LD) fuel cell (FC) vehicles. The adjustment factor, or K-factor, determines the fuel economy of an alternative fuel vehicle to that of a conventional gasoline vehicle. Table 5.2.2 lists a K-factor of 0.50 for Hydrogen/LD/FC drive-train which translates into a hydrogen fuel cell vehicle fuel economy of 2.0X in comparison to the gasoline baseline.

In taking account for the latest advancements in hydrogen fuel cell vehicles technology the K-factor for hydrogen vehicles should be increased to a higher value. At a minimum the K-factor for fuel cell vehicles (FCV's) should be consistent with the energy equivalent ratio (EER) for hydrogen fuel cell vehicles established in California AB 1007 State Alternative Fuels Plan. The EER for the FCV Hydrogen in AB 1007 is 2.4X in comparison to the gasoline baseline.

Furthermore, the latest advancements in lithium-ion battery technology for battery electric vehicles (BEV's) and plug in hybrid electric vehicles (PHEV's) are making their way into hydrogen fuel cell vehicles as well. Air Products believes that the most efficient platform for the future may well be a fuel cell hybrid. The leading high-efficiency hydrogen fuel cell powerplants and vehicle energy management systems are delivering driving energy efficiencies approaching three times (3.0X) greater than current gasoline vehicles.

Air Products Hydrogen Energy Systems would like to thank the Air Resources Board Energy Commission for providing this opportunity to submit comments on the Low Carbon Fuel Standard. We fully understand that the vehicle drive-train K-factor serves as the key variable in ultimately determining vehicle emissions along with how hydrogen will be sourced, produced, and made available for fueling. Other than securing renewable sources of hydrogen supply the standards proposed for hydrogen production required to achieve emission targets are challenging but achievable with a higher K-factor. We look forward to continuing to work on developing hydrogen supply and infrastructure solutions.

Pease feel free to contact me at (610)481-5222 if you have any questions or would like to discuss further.

Sincerely,

Brian B. Bonner
Product Manager
Hydrogen Energy Systems