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Why is Dimethyl Ether (DME) a "Renewable Gas" and what are the benefits to this Classification

Docket #: 17-IEPR-10 Project Title: Renewable Gas

Comments from: Sam McLaughlin
External Research Manager, North American Region
Volvo Group Trucks Technology

Submitted: Via online docket portal, July 14, 2017

Comment title: Why is Dimethyl Ether (DME) a "Renewable Gas" and what are the benefits to this Classification

Summary

Volvo Group respectfully submits these comments in response to the SB1383 Draft White Paper in preparation for the 2017 Integrated Policy Report.

In brief, Volvo Group strongly urges the CEC and cooperating state agencies to expand the definition of "renewable gas" to include dimethyl ether (DME). This is because DME can be a renewable gas derived from methane, a top short-lived climate pollutant in the state of California.

Additionally, DME should be specifically identified in the Draft White Paper as a fuel made from renewable gas that utilizes organically produced methane as a feedstock for a transportation fuel which can be used in highly efficient compression ignition engines (diesel cycle).

Volvo Group has been developing its DME-fueled truck powertrain technology for more than a decade. As such, Volvo strongly believes:

• DME is a transportation fuel solution to methane pollution and provides sustainable benefits as a replacement to petroleum diesel and fossil derived natural gas.

• DME is a form of renewable gas and should be classified as a renewable gas.

• DME provides a viable, short-term, carbon-negative diesel replacement fuel derived from methane.

Discussion

What is DME?

• Dimethyl ether (DME) is a simple, non-toxic molecule that burns sootless.

• It can be made from many sources, including biogas from dairy and other agricultural operations, municipal waste facilities and other sources.

• DME produced from biomethane represents a 90 percent reduction in well-to-wheel carbon and is not considered a GHG gas. It also offers a 9 percent reduction in carbon from in-cylinder combustion, compared to petroleum diesel.

How is it used in the engine?

The high cetane property in DME allows its use in more efficient compression ignition (diesel) engines, thus allowing an approximate 6-8% better thermal efficiency.

â€¢ Some 95 percent of a DME engine's parts are common with modern diesel engines.

â€¢ The ability to burn sootless allows for the elimination of the diesel particulate filter.

â€¢ Additional optimization may allow for better-than-diesel efficiency at lower NOx levels.

How is a DME engine used in the vehicle?

â€¢ Unlike every other alternative fuel (i.e. CNG, LNG, RNG, etc.), the use of a DME engine powertrain can maintain the vehicle's power and torque requirements.

â€¢ A DME vehicle will be capable of similar diesel equivalent fuel mileage efficiency and fuel mileage range.

Affordability

â€¢ Produced at commercial scale, we believe DME derived from methane can compete economically with other mainstream transportation fuels.

â€¢ Cost estimates for DME fuelled vehicles project that, at volume, the price will be equivalent to diesel fuelled vehicles.

â€¢ In the short term, we estimate the incremental cost of a DME Class 8 truck to be significantly less than that of a natural gas truck.

Benefits of DME as a biogas

â€¢ DME offers a low-carbon alternative fuel made from biogas.

â€¢ DME uses proven engine and vehicle technology at an affordable price.

â€¢ Unlike all other alternative energy possibilities, DME provides the features of a diesel vehicle but at a lower carbon footprint and without producing soot.

Final Thoughts

What's needed to increase the number of vehicle product offerings and vehicle volume sales to achieve SB 1383 goals?

â€¢ Public funding assistance for technology demonstrations; rebates or tax credits as purchase incentives for new technologies; agency assistance for communicating the benefits of technology winners.

What do fleet owners/managers need to see to make commitments and purchase/lease vehicles that can use biogas, biomethane and renewable gas as a fuel?

â€¢ Confidence in the availability and durability of vehicles, confidence in the availability and price of fuel; a positive business case for their vehicle purchase: fuel cost, maintenance cost, operational cost, resale value, service availability and the longevity of the company providing the vehicle.

What actions do you recommend the State of California take to achieve the SB 1383 SLCP goals and account for the views of utilities, investors, electricity generators, fuel developers, host site owners, vehicle manufacturers, vehicle fleet owners, environmental justice and public interest organizations, and local governments?

â€¢ Judge the fuel and vehicle on GHG benefit, criteria pollutant reduction AND customer affordability. How easily the fuel and vehicle can be commercialized should also be a consideration, especially in the shorter term.

Additional submitted attachment is included below.

Comments re AB1383 & 2017 IEPR

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