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California Energy Commission
1516 Ninth Street
Sacramento, CA 95814
Docket No.: 20-IEPR-02
Submitted via email to: docket@energy.ca.gov

Subject: Oberon Fuels Comments re 2020 IEPR Update

To Whom It May Concern:

Thank you for the opportunity to comment on the 2020 Integrated Energy Policy Report Update. Oberon Fuels supports this update to the IEPR as an important step to addressing California's energy needs and future policy paths.

Oberon Fuels (Oberon) is a California-based company that produces innovative, low-carbon dimethyl ether (DME), which can used directly as a diesel replacement fuel, a feedstock for renewable hydrogen and as a carbon reducer when blended with propane. We offer these comments in furtherance to the interests of California's drive to carbon neutrality by 2045.

Background
Dimethyl ether's (DME) clean-burning properties and versatility as a fuel can reduce greenhouse gas emissions and criteria pollutants in three different ways (see DME Tech Summary below). Thus, we believe DME has a key role to play in CARB's LCFS and other fuel and vehicle GHG and criteria emission policies.

DME can be produced from a variety of waste streams and renewable feedstocks and holds the potential to support the state's additional goals of methane reduction (SB 1383) as well as fossil fuel replacement. Finally, DME also provides an economical pathway to the end goal of zero-emission mobility and carbon neutrality.

Discussion/Recommendations
The CEC should consider expanding Chapter 7 on low-carbon liquid fuels in the 2020 IEPR Update. We note on page 2 of the chapter: "… (T)he state must ensure access to clean mobility options to ensure low-income and disadvantaged communities benefit from this transition."

Low-carbon fuels like Oberon's and others provide a clear path to decarbonization now and during the transition to full electric drive as envisioned by multiple state policies. Low-carbon, liquid transportation fuel provides an immediate onramp to the low-carbon economy for those sectors of the population that may have to wait decades for full electrification. Including more emphasis on low-carbon fuels now demonstrates the state's recognition of the real-time economic barriers to electric transportation. It also provides political durability for electrification policies whose climate impacts may be difficult to foresee and appreciate for many California residents.

“Transportation remains a key focus in the state’s efforts to address climate change.” – Page 3. We agree, the state should be employing all the policy tools available to promote the use of low carbon and carbon-neutral fuels such as those produced by Oberon Fuels.

On page 10, the Update notes: “… (S)ome transportation modes may be difficult to electrify.” Oberon agrees and can serve those sectors.

The IEPR’s liquid fuels chapter recommends the state prioritize low-carbon liquid fuels for sectors that are hardest to electrify: “These fuels also have the potential for reducing greenhouse gas and criteria pollutant emissions from diesel engines in the existing vehicle fleet as the state transitions to zero-emission vehicles."

We suggest this recommendation should be expanded – low carbon liquid fuels should be emphasized for near-term implementation to replace gasoline, diesel and jet fuel in all sectors in order to maximize near-term greenhouse gas reductions. Waiting decades for accelerated market transformation to electrification will not allow California to meet its climate policy goals.

Moreover, continuing to use a portion of funding from the CEC’s AB 118 Clean Transportation Program – dedicated to investments in advanced low-carbon fuel innovation, development and deployment – remains as important as ever.

As reported at the CEC’s June 11, 2020, IEPR update workshop, “Transportation Trends and Light-Duty Zero-Emission Vehicle Market Update,” Bloomberg New Energy Finance specialist Nick Albanese forecast ICE powertrain technologies will continue to constitute a significant portion of the passenger vehicle market through 2040.

This doesn’t account for the heavy-duty vehicle segment, which experts believe will continue to rely on ICE technology well into that future. We suggest the CEC recognize these fuels as vital to the long-term vehicle fleet mix reality, and that the carbon-reduction benefits of these fuels take their place alongside zero-emission technology.

DME Tech Summary

1) DME as a Diesel Replacement. To begin, DME has long been recognized as an excellent diesel replacement fuel. DME is a clean-burning, non-toxic, potentially renewable fuel. Its high cetane value (55-60) and quiet combustion, as well as its inexpensive fueling system, make it an excellent, inexpensive diesel alternative that will meet strict emissions standards and facilitate putting cleaner trucks, particularly Class 7-8 trucks, on the road.

DME has been used for decades as an energy source in China, Japan, Korea, Egypt and Brazil, and can be produced domestically from a variety of feedstocks, including biogas from organic waste produced in cities or by agricultural operations, as well as natural gas. Ideal uses in North America are in the transportation, agriculture, emergency power and construction industries. DME can be made from a range of options that can make it extremely competitive, if not significantly more affordable than traditional diesel.

DME is a gas under ambient conditions. However, because it can be stored as a liquid under moderate pressure, similar to propane (LPG), it eliminates the need for the high-pressure containers used for CNG or cryogenics, as in the case of LNG. DME’s easy handling properties make fueling and infrastructure relatively simple and inexpensive.

CARB's LCFS staff estimated the carbon intensity of DME produced from dairy biomethane by the Oberon process to be -278 (negative 278). DME is approved as a renewable fuel under the U.S. Environmental Protection Agency's Renewable Fuels Standard, making it eligible for RINs credits when made from biogas with the Oberon process. The EPA estimated that biogas-based DME offers a 68% reduction in greenhouse gases. DME has also been issued specifications by ASTM International and the International Organization for Standardization (ISO) to ensure that as DME is rolled out as a fuel the right standards and regulations are in place to ensure a robust supply chain.

Oberon Fuels is currently leading a project funded by the California Energy Commission to demonstrate pilot production of DME from renewable feedstocks at its plant in Brawley, California. The DME produced in this project will be used to blend with propane to reduce the carbon intensity of on-road vehicles.

2) DME for Propane Blending. The second way that DME can be used to put cleaner trucks on the road and decarbonize transportation is to blend it with LPG for use in propane-powered vehicles. Up to 20% DME can be blended with propane with limited or no changes to the vehicles or fueling infrastructure required. As mentioned, under ambient conditions, DME is a gas that can be stored as a liquid under moderate pressure, making it ideal for blending with propane.

As calculated by the California Air Resources Board, the current carbon intensity (CI) score of propane is 83 gCO_2e/MJ (ultra-low-sulfur diesel has a CI near 100 gCO_2e/MJ). CARB has calculated that, when DME is made from dairy biogas (which itself has a CI of -150), DME has a CI value of -278. With only a 5% blend of DME, propane's baseline CI value decreases from 83 to 65, and at a 20% blend the CI value decreases to just 11, enabling propane to approach carbon neutrality in an economic manner using the same vehicles and fueling infrastructure.

The combination of DME's handling properties, its ability to be produced from diverse, abundant, renewable resources, and its significant greenhouse gas-reducing qualities make it an excellent choice for blending with propane in the transportation sector and beyond.

3) DME as a Hydrogen Carrier. The third way in which DME can decarbonize transportation is as a hydrogen carrier. DME is an excellent carrier molecule for transporting hydrogen to power a new generation of light- and heavy-duty fuel-cell electric vehicles and to provide increased supplies of renewable hydrogen: DME is particularly dense in hydrogen, with six hydrogen atoms on each DME molecule.

DME can be made from a wide variety of renewable feedstocks, creating a new pathway for renewable hydrogen production.

DME liquefies at low pressure (~73 psi), making it much easier and less expensive to transport than hydrogen, which can be compressed at up to 10,000 psi of pressure. Converting DME into hydrogen is a simple, inexpensive process compared to natural gas to hydrogen conversion.

Conclusion

Every gallon of Oberon's fuel used on the road or in the air leaves a gallon of fossil fuel in the ground. We believe the 2020 IEPR Update should recognize this about DME and other low-carbon, liquid fuels.

Oberon understands California's policy focus is on electrification to reduce carbon emissions and reverse the catastrophic impacts the state and elsewhere are already suffering because of global warming.

We also believe policymakers should understand renewable fuels provide immediate, near- and long-term carbon reductions and should be considered integral to the transition to ubiquitous electrification of the transportation sector. Our fuels should be folded into the state's mission to slow and reduce the impacts of climate change.

All the Best,

Rebecca Boudreaux

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