MI Comments – Greg Dolan
DOE Hydrogen and Fuel Cells Technologies Office Stakeholder Listening Session – 1/7/23

My name is Greg Dolan, and I serve as the CEO of Methanol Institute, the trade association for the global methanol industry. MI represents the world's leading methanol producers, distributors, technology companies, and now the largest ship owners.

We appreciate the opportunity to give you our views on the 45V tax credit, which we expect to be a significant game changer for domestic methanol production in the United States.

Global methanol demand is 98 million metric tons or nearly 33 billion gallons per year. As a chemical derivative, methanol is used in thousands of everyday products, including plastics, paints, building materials and car parts. Methanol is also an emerging energy resource powering ships, cars, trucks, industrial boilers, cook stoves, gensets, and as a hydrogen carrier for fuel cell technology applications.

This past October, newbuild ship orders for methanol dual-fuel vessels exceeded the orders for LNG fueled ships. Methanol has now emerged as one of the leading future fuels for the global shipping fleet. Since Maersk announced in 2021 that its first carbon neutral container ship would be running on methanol, we've seen the world's largest vessel owners place $12 billion worth of orders for methanol vessels. One headline last month noted that 2022 was the year methanol went global in the shipping industry.

Methanol – CH3OH – is produced from synthesis gas, via five primary pathways:

Globally, most methanol is produced from the steam reformation of natural gas, mature technology, with plants that produce 5000 metric tons per day, this can be considered GREY methanol;
In China, they produce most of their methanol from coal gasification, which would be BROWN methanol;

BLUE methanol is derived from natural gas combined with carbon capture and utilization, and you can also reduce the carbon footprint of a natural gas-based facility by bringing in green hydrogen or CO2 over the fence, or replacing natural gas driven processes with electrically driven ones; and
GREEN methanol comes in two buckets, bio-methanol derived from biomass gasification or biogas; and e-methanol produced from renewable electricity and captured CO2 from industrial flue gases, biogenic sources or direct air capture.

To date, most bio-methanol and e-methanol plants have had annual production capacity of 4,000-5,000 metric tons per year. We are now tracking 80 projects globally, with planned capacity increasing to 50,000, 100,000 or 250,000 metric tons per year. These announced projects represent 8 million tons of renewable methanol production by 2027. The bulk of these projects are in China or in Europe. And it is our hope that the tax credits offered by the Inflation Reduction Act, particularly 45V, will allow this country to step up its game. Not only in the production of renewable methanol, but also for blue methanol with even higher production volumes.

We view methanol as a practical hydrogen carrier that can be used in the production of chemicals, in transportation, and for heat and power markets consistent with the low carbon objectives that have been identified in the BIL and the IRA.

As we noted in our comments to the DOE on the proposed Clean Hydrogen Production Standard, methanol is an efficient, effective, and safe way to store hydrogen as it packs the same number of hydrogen atoms per molecule as methane. As a liquid at ambient temperature and pressure, methanol has the highest hydrogen to carbon ratio of any liquid fuel.

Aligning the standard to incentivize the production of qualified clean hydrogen using existing hydrogen pathways will be key in achieving the goals of cleaner hydrogen production.
The BIL acknowledges that importance by stating that “the standard developed shall support clean hydrogen production from each source described in section 16154(E)(2) of

this title (e.g., including but not limited to fossil fuels with carbon capture, utilization, and sequestration (CCUS); and *hydrogen-carrier fuels (including ethanol and methanol).*"

The boundaries for the measurement of lifecycle greenhouse gas (GHG) emissions embodied in CHPS should recognize the transformation of hydrogen, as well as the CO_2 derived in the hydrogen production, into these carrier fuels. And this recognition should be consistent in moving from the BIL to the IRA.

While the DOE in its proposed CHPS guidance was concerned with establishing hubs for the direct transportation of hydrogen, encouraging and incentivizing existing hydrogen carrier fuels such as methanol to meet CHPS also achieves the DOE's goal to support clean hydrogen production and the growth of the clean hydrogen economy.

The Methanol Institute is largely in agreement with the DOE's proposed guidance as it relates to the definition of Clean Hydrogen as provided in the BIL and the standards for "Qualified Clean Hydrogen" as provided in the IRA.

However, because of the prevalence of hydrogen use in carrier fuels, and the opportunity therefore for significant improvements in the lowering of carbon intensity of hydrogen production, the Methanol Institute recommends that DOE and Treasury Guidance make more explicit that hydrogen produced through a syngas process -- and used in an intermediate process stage for the production of liquid hydrogen fuels such as methanol -- and measured for carbon intensity on a life cycle well to gate basis -- including the transformation of hydrogen and its co-products into that carrier fuel -- through the CCS removal process is included in the system boundary, both for purposes of the BIL and the IRA.

Thank you.