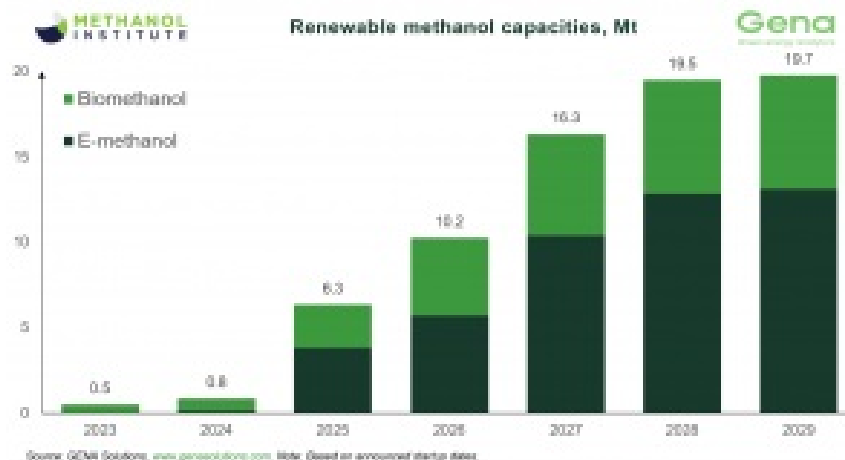


## Global Low Carbon Methanol Supply Rapidly Expanding

The Methanol Institute (MI) has partnered with Finland's GENA Solutions Oy to develop a robust database of biomethanol and e-methanol projects. The database identifies 131



production projects globally, with total projected capacity rapidly expanding to 19.5 million metric tons (6.5 billion gallons/24.6 billion liters) by 2028.

MI CEO Greg Dolan stated: "Just two years ago, we were tracking 80 projects with a total announced production capacity of 8 million metric tons by 2027. There are more than 130 projects in our joint database with GENA, topping 16 million metric tons in 2027 and 19.5 million tons by 2028. If we add low-carbon methanol projects, the total rises to nearly 24 million metric tons. Methanol will be prominent in the low carbon transition for hard-to-abate sectors like shipping, aviation, and chemicals."

Vitalii Protasov, CEO and co-founder of GENA noted that: "We are witnessing remarkable growth in renewable and low-emission methanol capacities, with around 6.5 Mt already in operational, construction, or engineering stages. This supply surge is poised to meet the increasing demand for renewable methanol and contribute to decarbonizing methanol and related industries."

The "[Renewable](#)" section of the Methanol Institute's website now has an interactive global map featuring key information on biomethanol and e-methanol projects including location, owner, project status, feedstock, year of

start-up, and total capacity. In addition, the “[Marine](#)” section of the website overlays this data with a listing of ports with methanol storage capacity and ports offering methanol bunkering supply for the growing fleet of methanol-fueled vessels.

There are currently 251 methanol newbuild vessels on the water or in the order book, including large container ships, chemical tankers, ferries, car carriers, and bulkers. A single large 16,000 TEU container ship can consume 35,000-40,000 metric tons of methanol per year. The anticipated demand for methanol as a marine fuel is driving much of the interest in expanding the supply of methanol from conventional and low-carbon feedstocks.


GENA has conducted studies on over 500 renewable and fossil fuel plants and projects globally in the methanol industry. The analysis methodology involves a diligent examination of technologies, material balances, costs, emissions, schedules, and commercial, and financial strategies for every facility within the comprehensive database. The project statistics encompass projects from pre-feasibility to operational stages, excluding closed or frozen projects, as well as concept-stage projects.

The Methanol Institute is also pleased to welcome GENA Solutions as its newest member company. To learn more about GENA Solutions, visit their website [HERE](#).

## Treasury’s 45V Regulation Risks Killing US Hydrogen In The Cradle

Last Friday, with the input of many member companies, MI submitted comments to the U.S. Department of the Treasury on the proposed regulation promulgated under Section 45V (Clean Hydrogen Production Tax Credit) which was enacted under the Inflation Reduction Act (IRA) of 2022.

The IRA Clean Hydrogen Production Tax Credit could unlock significant US investments that could catapult low-carbon and renewable methanol production. The 45V tax credit could also significantly lower the cost of e-methanol and benefit the U.S. projects



**METHANOL INSTITUTE**  
WASHINGTON - SINGAPORE - BRUSSELS - BEIJING - DEHLI

February 23, 2024

Internal Revenue Service  
CC:PA:LPD:PR (REG-117631-23)  
Room 5203  
P.O. Box 7604, Ben Franklin Station,  
Washington, DC 20044

**Re: REG-117631-23: Section 45V Credit for Production of Clean Hydrogen, Section 48(a)(15) Election to Treat Hydrogen Production Facilities as Energy Property**

The Methanol Institute (“MI”) was founded in 1989 and serves as the global trade association for the methanol industry. MI has over 90 member companies representing the world’s leading methanol producers, consumers, distributors, and technology companies. In recent years, MI has seen rapid growth in the bio-methanol, e-methanol, and marine sectors. In fact, MI now counts four of the world’s leading container ship lines as members: Maersk, MSC, CMA-CGM, and COSCO. The growth of methanol as a marine fuel is critical not only to the future of the methanol industry, but also to the goal of reducing global greenhouse gas (“GHG”) emissions. Based on this experience, the methanol industry is well-positioned to grow its market-share more broadly in the transportation sector, a position that can be further sustained with favorable tax treatment. The overall economic footprint of the methanol industry is vast. MI member companies employ over 600,000 people across the globe. Methanol is one of the world’s most heavily traded and shipped chemical commodities. For context on the economic impact of methanol on the United States, a typical domestic methanol plant that produces 1.5 million metric tons per annum of methanol drives capital spending of \$1.1 billion and has an economic ripple effect worth an additional \$1.5 billion. In short, the methanol industry is critical to the American economy.

As clean hydrogen is a necessary and significant key building block to produce clean methanol, MI welcomes the opportunity to comment on the proposed regulations (the “Proposed Regulations”) promulgated under sections 45V (“45V Credit”) and 48(a)(15) of the Internal Revenue Code (the “Code”), which were enacted under the Inflation Reduction Act of 2022 (“IRA”) to incentivize the production of clean hydrogen domestically.<sup>1</sup> MI acknowledges the hard work and effort by the U.S. Department of Treasury and the Internal Revenue Services (the “Treasury” and the “IRS”, respectively) in drafting rules for the 45V Credit that will accelerate investments in clean hydrogen production. MI’s comments on the Proposed Regulations are as follows:

1. Clarify that the definition of qualified clean hydrogen is inclusive of hydrogen produced in a gas stream, such as syngas, where such gas stream (i) is not solely composed of hydrogen and (ii) is held for sale or use as a valorized product (e.g., syngas used in the production of methanol).

<sup>1</sup> Unless otherwise indicated, all textual references to “section” herein are to sections of the Internal Revenue Code of 1986, as amended.  
<sup>2</sup> Pub. L. 117-169, 136 Stat. 1936, 1939, 1939 (2022).

of many members.

MI's comments address several of these areas and propose solutions that would better create an environment where clean hydrogen production can flourish and benefit the methanol industry.

For instance, MI's comments note that the final regulation should Clarify that the definition of qualified clean hydrogen is inclusive of hydrogen produced in a gas stream, such as syngas, where such gas stream (i) is not solely composed of hydrogen and (ii) is held for sale or use as a valorized product (e.g., syngas used in the production of methanol).

MI's comments also address the issue of temporal matching by advocating that the final regulation should allow for an extended transition period from annual matching of electricity to hydrogen production to monthly or hourly matching that better aligns with requirements in the EU. MI also asks that the regulations streamline the process for electricity stored in batteries so that its time stamp correlates to the time the electricity is used in producing clean hydrogen rather than when the electricity was generated or stored in the first place. In addition to these subjects, MI's comments touch on several other areas of importance to the methanol industry.

A recent article from *Forbes* describes the many flaws inherent in the Treasury Department's proposed regulations. Excerpts of the *Forbes* article are included here: "Absent a major change of course, the US Treasury Department is poised to issue guidance on new regulations governing Inflation Reduction Act-related hydrogen incentives that few players in the industry seem to favor. The controversy revolves around a draft regulation issued in December governing the implementation of expanded tax credits in Section 45V of the IRA, which President Joe Biden signed into law in September 2022.

That December draft seemed to please almost no one in the hydrogen space, not even those involved in projects to make "green" hydrogen using an electrolysis process powered by wind, solar, or other zero-emission power generation. Because the making of hydrogen is such an energy-intensive process, the ability to access the full level of the 45V credit is crucial to the economics of most projects in the planning stages.

The full *Forbes* article is available [HERE](#), and MI's comments are available on our website [HERE](#). Should you have any questions, please reach out to Larry Navin in MI's Washington, DC office at [lnavin@methanol.org](mailto:lnavin@methanol.org)

## Methanol: Going Mainstream

From new engines to retrofit solutions, design approvals to vessel orders and bunkering agreements, methanol was everywhere in 2023, but as Gregory Dolan, CEO of The Methanol Institute discusses

in Bunkerspot, the transition process to a cleaner shipping industry continues.

So, what does 2024 have in store for methanol as a marine fuel? The signs are certainly positive; methanol provides a practical, implementable pathway for the maritime industry regarding timescale, regulation, and fuel production. The technology is in place: proven, approved, and straightforward to implement in practice.

'It will be important to adopt a transition approach that facilitates the contribution of conventional, blue and green fuels towards targets for low carbon and for net carbon neutral emissions'



Gregory Dolan

Image © Methanol Institute

As the IMO develops its own GHG lifecycle guidelines this year, it will be important to adopt a transition approach that facilitates the contribution of conventional, blue, and green fuels towards targets for low carbon and net carbon neutral emissions. A market mechanism will ultimately be essential and is something the industry needs to work together to promote.

We will continue providing the support the industry needs, from newbuilding and retrofit decisions, informing regulation and policy, and promoting the infrastructure enabling the energy transition.

The full article is available [HERE](#).

# BUNKERSPOT

# 2024

## INSIDE:

SHIP.ENERGY SURVEY 2024  
EBDNS  
ELECTROFUELS

## Maersk Names First Vessel of its Large Methanol-Enabled Fleet “Ane Maersk”

The world's first large methanol-enabled container vessel was named "Ane Mærsk" at a ceremony in the HD Hyundai

Heavy Industries (HD HHI) shipyard in Ulsan, South Korea. The vessel is named after Ane Mærsk Mc-Kinney Uggla, the Chair of the A.P. Moller Foundation and A.P. Moller Holding. Ane's eldest granddaughter served as godmother and christened the vessel by breaking a champagne bottle over the bow.



“Ane Mærsk” is the first of MI member Maersk’s 18 large methanol-enabled vessels, that will be delivered between 2024 and 2025. It is the world’s second methanol-enabled container vessel. In the beginning of February, it will enter service on the AE7 string connecting Asia and Europe, marking a significant milestone in the company’s commitment to pioneering low-emissions shipping solutions. The vessels in the new series have an industry-first innovative design with the bridge and accommodation placed at the very front of the vessel, which ensures fuel efficient operations.

Said Vincent Clerc, Maersk CEO: "This series of vessels will have a transformative impact on our ambition to progress on our industry-leading climate ambitions. It is a visual and operational proof of our commitment to a more sustainable industry. With “Ane Mærsk” and her sister vessels we are expanding our offer to the growing number of businesses aiming to reduce emissions from their supply chains."

“Ane Mærsk” will begin her maiden voyage on green methanol and Maersk continues to work diligently on 2024-2025 sourcing and bunkering solutions for its methanol-enabled vessel fleet.

For more information please click [HERE](#).

## Evergreen Marine and Yang Ming to Order up to 21 New Containers from CSBC

Taiwanese shipping companies Evergreen Marine and Yang Ming Marine Corp. are preparing to place orders for methanol dual-fuel-powered feeder container ships with CSBC Corporation, Taiwan, for six and 15 ships, respectively, iMarine reported, citing industry sources.

The above orders are currently in the negotiation stage, and further details such as the specifications of the ships have not yet been disclosed, but it is reported that the two owners will order 1,800 TEU Bangkok



**EVERGREEN**

Max container ships or 2,900 TEU feeder container ships. Regarding fuel selection, both favor methanol fuel. Currently, CSBC Corporation, Taiwan has already prepared for these two types of container ship design, the shipyard has built ten 2900TEU container ships for Evergreen Marine, iMarine reported.

As the contract has not yet been formally signed, the delivery schedule of this series of new ships has not yet been clarified. At present, most of the Asian shipyards are tightening their ship slots and the delivery schedule has been scheduled 2 to 3 years later, but CSBC Corporation, Taiwan can achieve the earliest delivery date of 2025 based on sufficient ship slots.

More information is available [HERE](#).



## Ulsan Hosts First Ship-to-Ship Methanol Bunkering Operation



Ulsan port recently handled the world's first ship-to-ship (STS) green methanol supply to a very large container ship, South Korea's Ministry of Oceans and Fisheries (MOF) and the Ulsan Port Authority (UPA) announced.

The 16,000-twenty equivalent unit Ane Maersk, belonging to MI member **A.P. Moller-Maersk**, received the green methanol from bunkership Golden Sunny Hana owned by Hana Marine at the Ulsan Port anchorage, according to a statement by UPA.

MOF established the foundation for the feat, including crafting the 'Guidelines for Approval of Self-Safety Management Plan for Methanol Supply', and accumulating know-how through two methanol supply demonstrations with UPA in July and November last year.

The ability to handle ships supplying green methanol will not only enable Korean ports to further consolidate their position in the world as a sustainable marine fueling location but will promote the growth of Korea's sustainable marine fueling industry amid intensified competition among global ports for the methanol fuel market, UPA said.

More [HERE](#) and [HERE](#).

## Interview: Alfa Laval's Solutions for Sustainable Shipping

MI member Alfa Laval specializes in heat exchange, separation, and fluid transfer. Founded 140 years ago and based in southwestern Sweden, the company focuses on three strategic areas: water treatment for the food and pharma industries, #energy (from energy production to distribution), and the #maritime sector.



The company indeed offers innovative solutions to support maritime industries in their energy transition away from fossil fuels toward #decarbonized energy across all links in the chain.

While the Euromaritime exhibition was held in Marseille last week, the publication Direct Industry spoke with Jean-Jérôme Semat, CEO of Alfa Laval France.

When asked to discuss FCM Methanol, one of Alfa Laval's innovations, Semat noted: "Our Fuel Conditioning Module Methanol (FCM Methanol) is designed to deliver methanol while adhering to the flow, pressure, temperature, and filtration parameters specified by the engine manufacturer. This adaptable technology can be customized for use with various types of engines and tanks. This system has been proven since 2015 and can supply methanol to both main and auxiliary marine engines, as well as boilers."

There is also a new company called OceanBird, which Semat discussed, noting: "We've created a company called Oceanbird, where we implement sail systems on both new and existing vessels to offset a portion of fuel consumption. This ties into the other company we acquired, which specializes in maritime route calculations, as the wind detected by weather forecasts will propel these sails. It's truly a comprehensive ecosystem.

In addition, we have an energy division. We've joined a consortium called Liquid Wind, which focuses on producing e-methanol from wind energy. The goal is to establish wind farms to store renewable energy and produce e-



methanol for consumption, envisioning offshore wind farms powering ships, thus completing the cycle.

Our approach involves working across the entire value chain to address Scopes 1, 2, and 3, aiming to decarbonize the industry. Decarbonizing just one aspect is beneficial, but given our challenges, we must address all fronts.

Our energy relies heavily on fossil fuels, contributing significantly to CO2 emissions and climate change. Hence, Alfa Laval's decision to achieve carbon neutrality for Scopes 1 and 2 by 2030, reduce Scope 3 emissions by 50%, and achieve net-zero Scope 3 emissions by 2050.

We recognize that we can't bring products to market without ensuring our sustainability."

The full interview is available [HERE](#).



## M2X Energy & Element 1 Corp Partner to Demonstrate New Pathway to Hydrogen From Stranded Gas, Through Methanol Carrier



# M2X

MI member **M2X Energy**, a startup company with a proprietary process technology that converts stranded gas into low-carbon methanol, and MI

member **Element 1 Corp**, a global leader in advanced hydrogen generation systems for the fuel cell industry, announced today that they are conducting a joint research and development program to explore the use of M2X low-carbon methanol as a feedstock for point-of-use hydrogen production.

Element 1 demonstrates the viability of low-carbon methanol produced by M2X's gas-to-methanol unit as a feedstock for its hydrogen generation unit and subsequent conversion to electricity. The process technologies developed by the two companies can unlock the potential for clean energy production in demanding locations where power grids are overloaded and operating conditions require adaptability and grid independence. After confirming that M2X's low-carbon methanol is a suitable feedstock for Element 1's methanol-to-hydrogen systems, methane-rich stranded gases that today are often flared or vented may instead be harnessed for downstream stationary power applications, hydrogen refueling stations, and on-board generation for hydrogen-fueled road vehicles, trains, and maritime vessels.

Early methanol testing produced by M2X Energy shows promising results for unlocking hydrogen as a cost-competitive and low-carbon chemical sourced from stranded gases. *"M2X is excited about this collaboration with Element 1. Serving as a supplier of low-carbon methanol for Element 1's process equipment demonstrates our product market fit and the value of M2X low-carbon methanol as an attractive, low-cost hydrogen carrier, especially during the energy transition,"* commented Paul Yelvington, Chief Science Officer at M2X.

With details emerging on the implementation of production credits for hydrogen and clean fuels in the U.S.'s Inflation Reduction Act (e.g., 45V and 45Z), M2X Energy and Element 1 are well-positioned to provide an integrated pathway to cost-competitive, low-carbon hydrogen with greatly simplified logistics for production, transportation, and storage.

Dave Edlund, co-founder and CEO of Element 1 Corp, said, *"Low-carbon methanol, such as that produced by the M2X process, offers the most economical and practical pathway to widespread adoption of grid-independent electricity production while maintaining a low-carbon footprint. We are pleased to be partnering with M2X Energy on this important demonstration."*

This cross-industry collaboration aligns with the strategic priorities announced at COP28 for reducing methane emissions and expanding the role of hydrogen as an alternative energy carrier. It lays the groundwork for future commercial partnerships for the supply of M2X Energy's low-carbon methanol in deployed hydrogen generation equipment using the Element 1 technology. More information is available [HERE](#).



***Element 1***  
Powering Innovation

**Danaos Returns to Yangzijiang for Two More**

## Methanol-Ready Containerships



Greek shipowner and MI member Danaos Corporation has placed a \$188.4 million order for the construction of two methanol-

ready 8,258 TEU containerships at Yangzijiang shipyard in China.

The latest fleet renewal move brings the company's orderbook to twelve ECO methanol-ready containership newbuilds with an aggregate capacity of 91,430 TEU.

The deliveries are spread across 2024 and 2027, with the latest two additions scheduled for the fourth quarter of 2026 and first quarter of 2027, respectively.

"Danaos has also recently ordered two more 8,258 TEU vessels at Yangzijiang shipyard and we now have a total of four vessels under construction at that shipyard with deliveries scheduled for the second half of 2026 and the first quarter of 2027. All twelve vessels in our newbuilding program are methanol ready and are designed with the latest eco characteristics. Demand for shipyard delivery slots is very high as the industry is quickly moving to reduce carbon emissions by operating green vessels," Danaos' CEO Dr. John Coustas, said.

Danaos said that all of its ships under construction will be fitted with alternative maritime power units and built under the latest requirements of the International Maritime Organization. This means that they will meet Tier III emission standards and Energy Efficiency Design Index (EEDI) Phase III. More information is available [HERE](#).



## Caterpillar Joins Solstad, Pon Power to Tackle OSV Fleet Emissions



member **Caterpillar Marine** and Cat dealer **Pon Power** to increase the fuel efficiency and reduce greenhouse gas (GHG) emissions from its offshore support vessel (OSV) fleet.

Under a memorandum of understanding (MoU) between the three parties, emissions-reduction technologies, potentially using batteries and alternative fuels such as methanol, will be evaluated for use in the Norwegian OSV owner's existing fleet.

Solstad has a net-zero GHG target in 2050 and expects to reduce CO2 emissions through optimised energy efficiencies and retrofitted vessels that operate with alternative fuels such as methanol. Additionally, future newbuild OSVs must be designed from the outset to operate with either low- or zero-emissions profiles, and solutions developed by Caterpillar Marine from this MoU will be evaluated for Solstad's existing fleet.

Solstad has expressed interest in methanol and ammonia as alternative fuels for its fleet. Additionally, as of 1 October 2023, Norway has issued a biofuel blending mandate requiring domestic fuel suppliers to blend as much as 6% hydrogenated vegetable oil (HVO) or fatty acid methyl ester (FAME) into marine fuels. These advanced biofuel blends are supplied only for Norway's domestic shipping market.

"Caterpillar Marine is committed to helping vessel owners increase fuel efficiency and reduce GHG emissions," said the engine builder in a press statement, adding, offering "pathways to support these operational and sustainability targets by providing a range of solutions for alternative fuels and powertrain integration."

Caterpillar Marine vice president and general manager Brad Johnson said the four-stroke engine builder is "committed to supporting our customers' climate-related objectives through methanol-powered solutions."

More information is available [HERE](#).



# UPCOMING INDUSTRY EVENTS

Fueling the Future: How Renewable Methanol is Paving the Way for Sustainable Energy

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