BREAKWAVE ADVISORS

Maritime Decarbonization Monthly

August 2023

Thought of the Month:

"Ship owners are increasingly favoring methanol as an alternative fuel type"

The Big Picture

In July, **the majority of ship owners who ordered newbuildings with alternative fuels chose methanol**, as reported by the classification society DNV. According to their monthly report, 62 ships were ordered with alternative fuels. Meanwhile, the SEA-LNG coalition has shared an analysis of the green LNG bunkering market, revealing that BIO-LNG is gaining ground. This biofuel is available today in nearly 70 ports worldwide, including major locations such as Singapore, Rotterdam, and the US East Coast. The coalition's online Bunker Navigator tool has been updated to reflect the expanded availability of bio-LNG as a marine fuel, providing information on the bunker availability of fuels in the LNG pathway worldwide.

What's New

Five partners from Australia and Japan have signed a research and development agreement to **develop solutions for the industrial-scale shipment of CO2**. Future Energy Exports, JX Nippon, Low Emission Technology Australia, Mitsui O.S.K. Lines and Osaka Gas will study the feasibility and viability of low-pressure, low-temperature solutions for CO2 transport by ship. The project will investigate the behavior and evaporation characteristics of liquid CO2 under dynamic operating conditions and the effects on non-CO2 components. This project aims to **eliminate operational risks and increase the likelihood of technical feasibility**. If successful, technologies required to safely and efficiently transport large volumes of CO2 could be developed.

Our View

Recent trends suggest that **methanol fuel adoption among shipowners is poised to significantly outpace even LNG fuel alternatives**. While biofuel options are actively evolving for the maritime sector, it's important to acknowledge that the maturation of alternative fuel supply chains is essential to achieving the ambitious goal of net-zero carbon emissions. The growing prominence of methanol as a ship fuel stems from its **remarkable advantages**. Not only does methanol combustion produce fewer particulate emissions than LNG, but it also offers better energy efficiency, making it an attractive option for ship propulsion. Moreover, methanol can be synthesized from various sources, including natural gas, biomass, and even carbon dioxide, granting **flexibility in the production process**. In contrast, while biofuels exhibit promise to reduce shipping emissions, its development faces intricate challenges. Undoubtedly, the transition to alternative fuels entails multifaceted challenges. Establishing a net-zero carbon emissions trajectory for maritime transport hinges upon expediting the development of comprehensive supply chains that can ensure the steady availability of alternative fuels.

Industry Trends

Fuels

Mitsubishi Shipbuilding Co, part of the Mitsubishi Heavy Industries (MHI) Group, has announced that it is developing an ammonia handling system to support the use of ammonia as a marine fuel. As part of this development project, Mitsubishi Shipbuilding has begun demonstration testing of the Ammonia Gas Abatement System (AGAS), a subsystem of MAmmoSS to treat surplus ammonia safely.

Biofuels

Methanol producer **Proman** and carbon-negative materials company **Origin Materials** have entered a strategic partnership centered on low-carbon biofuel production utilizing Origin's technology platform and Proman's fuel capabilities and expertise.

Marine fuel supplier **Peninsula** has signed its first biofuel contract with Japanese shipping company **Kawasaki Kisen Kaisha** (K Line). In August, Peninsula arranged the delivery of 700 tons of UCOME-based B24 marine biofuel to K Line's oceangoing bulk carrier M/V Cape Amal in Hong Kong through local physical supplier **Chimbusco Pan Nation**.

Green Bunkering

The world's first container ship powered by green methanol, operated by Danish shipping giant **A.P. Moller Maersk**, has made a bunker stop in Egypt. According to the General Authority for the Suez Canal Economic Zone, this was the first environmentally friendly bunkering of a container ship with methanol in the port of East Port Said. The bunkering was carried out on August 17. The ship arrived in Egypt as part of its maiden voyage from Ulsan, South Korea, to Copenhagen, Denmark.

New Vessel Design

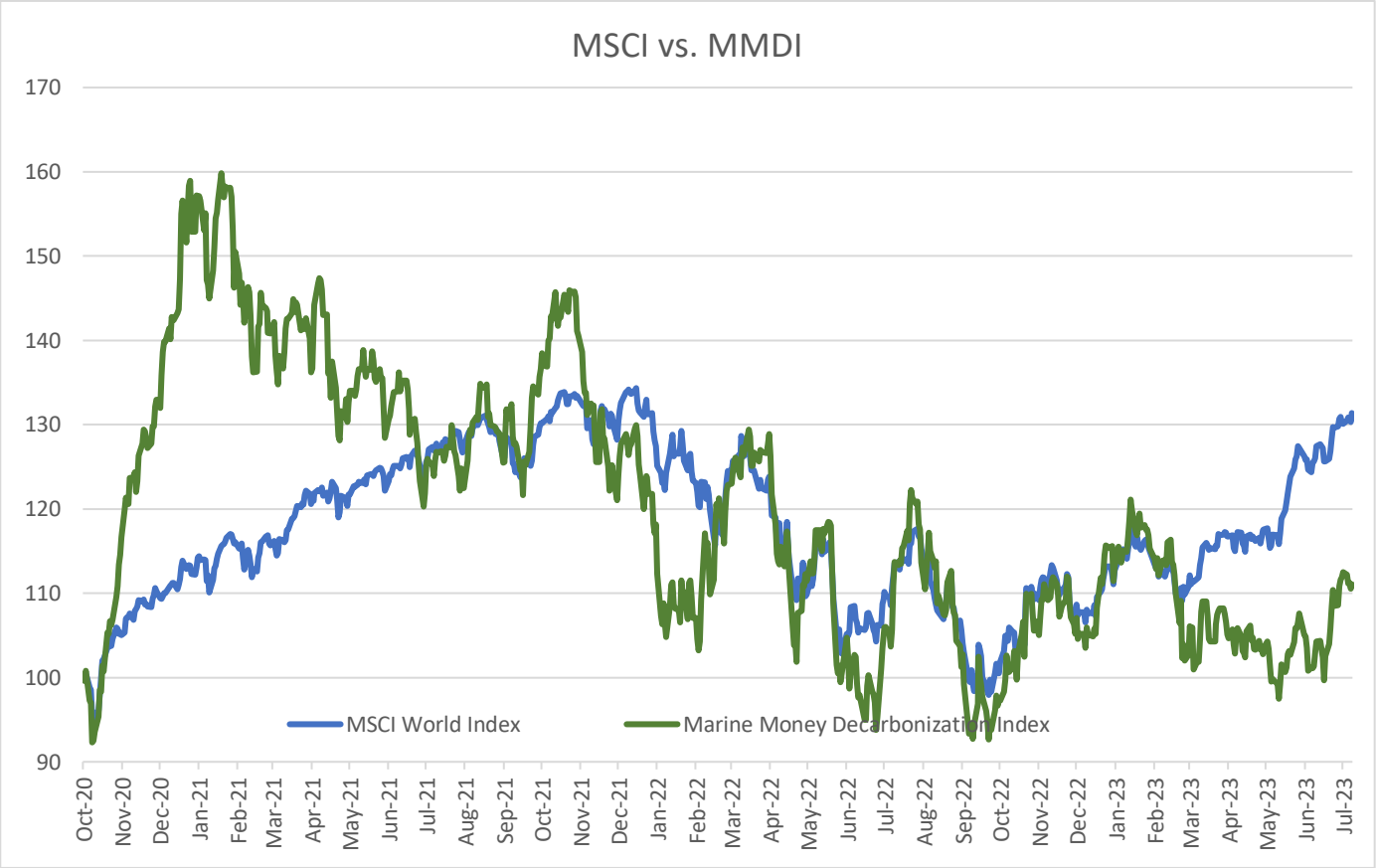
Cargill, one of the largest ship charterers in the world, has been exploring wind-assisted propulsion as a clean energy option. Wind was a common method of propulsion for ships before the switch to steam and diesel engines but it is now mostly used on smaller vessels. The U.S. commodities group said that a Cargill chartered dry bulk ship has launched on its first voyage since being fitted with special sails, aiming to study how harnessing wind power can cut emissions and energy usage in the shipping sector.

Technology

Wah Kwong, **Veer Voyage** and **North Star Shipping** have agreed to take on the **Zero Emissions Ship Technology Association** (ZESTA) challenge. ZESTA is a global industry body representing technology and fuel providers that have already committed to zero emissions. While other shipping companies have already committed to becoming carbon neutral by 2025, and Maersk has set a target to become carbon-free by 2040, the intention to be carbon-free by 2043 is a big step forward.

Green Ships

Greek shipowner and operator **Euroseas** has taken delivery of its second eco newbuild, M/V Terataki, from **Hyundai Mipo Dockyard Co.** in South Korea. The M/V Terataki, classified as a 2,800 TEU feeder containership, is compliant with the Energy Efficiency Existing Ship Index (EEDI) Phase 3 standards on energy efficiency thanks to its Tier III engine.



Relevant Prices

Fuel Prices	Price	YOY
Crude Oil, Brent	84.28 $/bbl	-15.2%
Natural Gas, Henry Hub	2.53 $/MMbtu	-73.0%
LNG, Korea/Japan	12.92 $/MMbtu	-80.5%
Coal, Rotterdam	130 $/mt	-63.4%
VLSFO, Rotterdam	589 $/mt	-20.4%
Methanol, China	33.66 $/mt	-2.0%
Palm Oil, Malaysia	32.88 $/mt	-9.9%

Stock Indices

Marine Money Decarbonization Index	310	-13.8%

Carbon Emission Allowances

EU Emission Allowances	91.62 $/kt	-4.4%
UK Emission Allowances	59.91 $/kt	-50.1%

Note: All prices as of last closing prior to the report; Sources: Bloomberg and Breakwave Advisors

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