

Maritime Decarbonization Monthly

January 2022

Thought of the Month:

“2022: The year of drastic changes for the zero emission goals”

The Big Picture

The new year started with dramatic **developments** in the **pathway towards zero emissions** shipping. **Denmark’s** decision to aggressively push for climate-neutral shipping and set the ambitious goal of being **climate neutral by 2050**, is setting the stage for more countries to push the envelope when it comes to decarbonizing maritime. **12 months** from now, new **regulations** will come into effect as it relates to shipping emissions, and time is running out for solutions and operation adjustments for the overall shipping industry.

What’s New

The International Council on Clean Transportation (ICCT), an independent nonprofit organization that provides research and technical analysis to environmental regulators, published a **white paper focusing on dry bulk shipping** and the sector’s path to **zero emissions**. The paper considers whether liquid hydrogen (LH2) fuel cells or compressed hydrogen (CH2) fuel cells could replace fossil fuels for bulk carriers by investigating three model ships of varying sizes. The research results indicated that the smallest bulk carriers do not have enough **space** for LH2, however, shorter trip legs could be achieved with the use of rotor sails combined with LH2 and longer trips would require replacing part of cargo space with LH2 along with the installation and use of four rotor sails.

Our View

The journey to **carbon neutrality** will not be an easy process, and for the shipping industry every decision comes at a **cost**. For example, there are concerns over the infrastructure of green fuel supply. However, mega projects are already underway that will ensure the future availability of alternative fuels. As an example, in May of last year, an international consortium of leading energy companies (OQ, InterContinental Energy and EnerTech) announced the development of an integrated green fuels mega **project in Oman** making the country the **world leader in green hydrogen and green ammonia**.

Such developments increase our confidence that shipping will be in a position of strength to choose and adapt to the new reality without major disruptions. **Shipping** needs green ammonia to decarbonize, as does the **aviation** sector, which is also expected to utilize synthetic fuels made from green hydrogen. One should also not forget that the ground transportation sector, which includes **rail and trucking**, is also expected to adopt green hydrogen as a fuel source. The investments needed for all those developments are underway, and the benefits and return potential of such projects will be substantial for the early investor.

Industry Trends

Fuels

Ammonia and LNG **bunkering** once again were in the spotlight for the Singaporean fuel market:

- **Keppel** and **Sumitomo** teamed up to explore the feasibility of introducing ammonia bunkering into Singapore within the next couple of years. The Singapore and Japan-based companies said that they will **accelerate** the development of an **ammonia bunkering vessel** with an aim to commence commercial operations in the mid-2020s. Ammonia is expected to play a major role as an energy carrier for hydrogen since it is easier to liquefy and transport than hydrogen.
- **FueLNG**, the joint venture between Keppel O&M and Shell Eastern Petroleum, recently said that the adoption of **LNG** in Singapore has **increased** considerably, with over **460 operations** conducted in 2021, comprising ship-to-ship (STS) and truck-to-ship (TTS) bunkering, and truck-to-industry operations. In 2022, FueLNG will start providing **LNG bunkers** to five LNG-fueled **Newcastlemax bulk carriers** which have been chartered by BHP to transport iron ore between Western Australia and China.

Technology

The first days of the New Year revealed strong activity for ammonia-fueled vessel concepts.

- **Sumitomo**, the major trading house, launched a project to design and develop an **ammonia-fueled 80,000 dwt dry bulk carrier** together with Oshima Shipbuilding with a planned first ship due to deliver by **2025**.

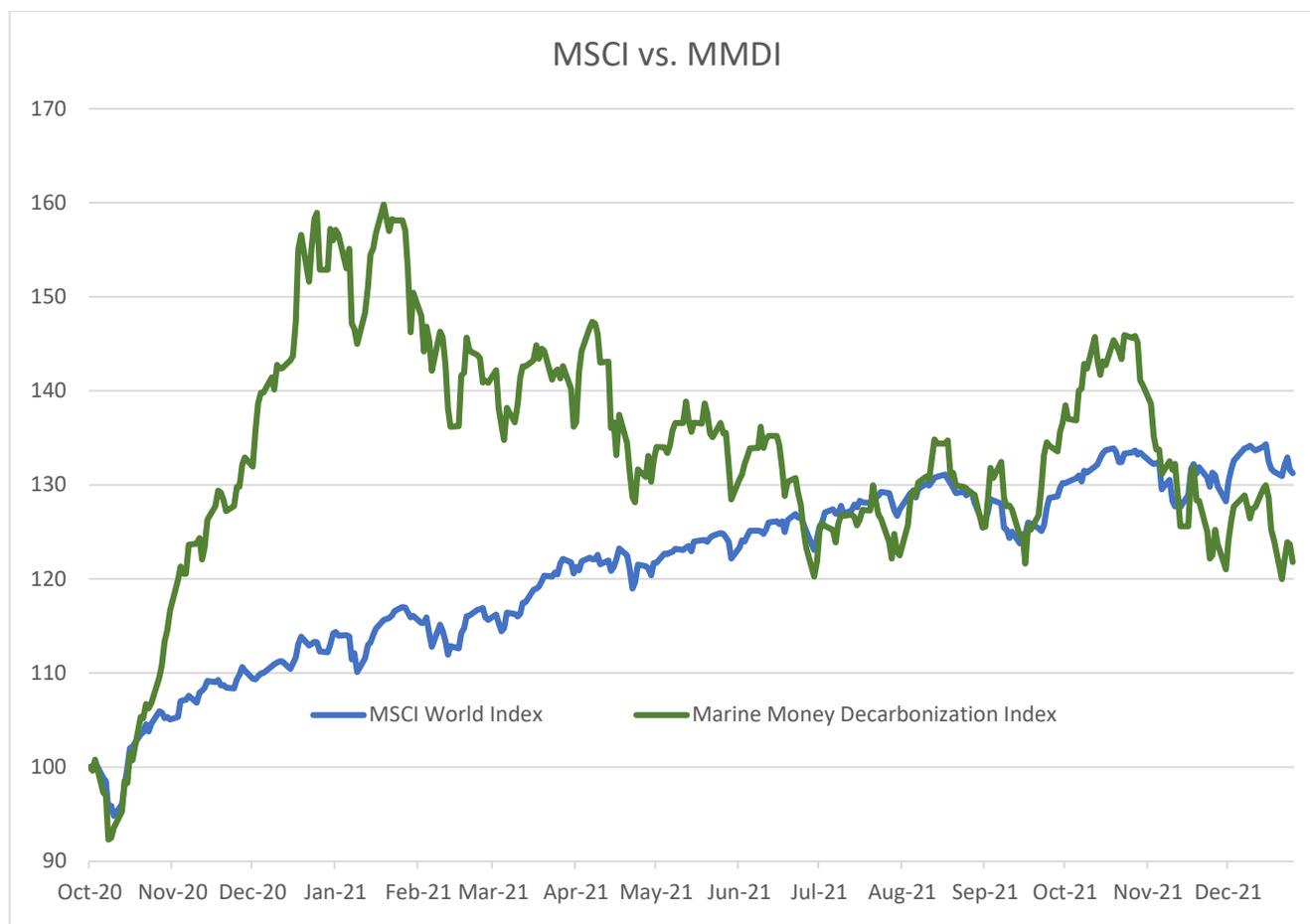
- **The Korean Register** awarded **approval in principle (AiP)** to **two green ammonia fueled ships**: one is a 60,000m³ ammonia-fueled ammonia carrier and the other is a 38,000m³ ammonia carrier/bunkering ship, developed by Korea Shipbuilding & Offshore Engineering (KSOE), Hyundai Heavy Industries (HHI) and Hyundai Mipo Dockyard (HMD). The AiP is the first result of the 'Green Ammonia Marine Transport and Bunkering Consortium' which was launched in May 2021.
- **The American Bureau of Shipping (ABS)** granted an **AiP** to an **ammonia-fueled Newcastlemax bulker** design from the ship management company Anglo-Eastern Technical Services (AETS). According to AETS, the system was designed for retrofit to existing vessels as well as ammonia-fueled and ammonia-ready newbuilds.

In the **LNG** segment, there was also fresh activity reported for the dry bulk and car carrier segments.

- Japanese shipbuilder **Mitsubishi Shipbuilding** has sealed an **order** for the FGSS (fuel gas supply system) of six new LNG-fueled car carriers.
- In the dry segment, the Japanese owner, **NYK Line** ordered four LNG-fueled Capesize bulk carriers at three shipyards in Japan and China.

Green Ships

The world's first liquefied **hydrogen carrier** launched its first trip in January to pick up a cargo in Australia destined for Japan. Japan's Kawasaki Heavy Industries (KHI), which oversees the project, is looking at building more ships to carry this ultra-chilled fuel.



Relevant Prices

Fuel Prices

	Price	YOY
Crude Oil, Brent	85.89 \$/bbl	116.3%
Natural Gas, Henry Hub	3.99 \$/MMbtu	63.2%
LNG, Korea/Japan	22.09 \$/MMbtu	160.3%
Coal, Rotterdam	162 \$/mt	137.5%
VLSFO, Rotterdam	436 \$/mt	38.0%
Methanol, China	41.90 \$/mt	10.1%
Palm Oil, Malaysia	51.47 \$/mt	51.8%

Stock Indices

Marine Money Decarbonization Index	325	-32.5%
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Carbon Emission Allowances

EU Emission Allowances	94.82 \$/kt	145.0%
UK Emission Allowances	104.89 \$/kt	72.3%

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

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