BSEA

BREAKWAVE ADVISORS

Maritime Decarbonization Monthly

December 2021

Thought of the Month:

"The global race to zero is on. Collaboration is the fuel for future..."

The Big Picture

Shipping, a traditionally conservative and slow-moving by nature industry, needs to **change** its **'wait and see' mentality towards decarbonization**, as pressure grows on all supply chains to cut GHG emissions. Developing, launching, and scaling sustainable fuel alternatives, combined with the necessary onshore infrastructure, are the leading barriers to maritime decarbonization.

What's New

The 77th Marine Environment Protection Committee **(MEPC 77)** held at the end of November once again exposed the **lack of global regulation** towards the net zero target when it comes to shipping decarbonization. The key topics on the agenda during the meetings included the revision of the Initial Strategy for the reduction of shipping GHG emissions by at least 50% by 2050, the approval of a $5 billion research and development fund, an agreement on a market-based measure of emissions and a resolution on black carbon emissions in the Arctic. **Several proposals** were on the table including a cap-and-trade system as well as the introduction of a carbon levy. A system revolving around a carbon levy seems to the preferred path, but **no decisions** were made. The next working group set up to discuss the options available in the MEPC 78 meeting is in June 2022.

Our View

The outcome of the last IMO meeting shows that **global regulation will not** act as a catalyst in the next few years' vital development towards shipping decarbonization. No carbon tax or levies have been introduced, nor dedicated funds to support decarbonization have been proposed (other than R&D), and even the initial target reduction strategy remains unchanged. There seems to be a consensus that climate change targets and deadlines set for and by the shipping sector will not be met without global regulation. **Market based measures**, such as carbon pricing, provide an economic incentive to pursue less GHG intensive behaviors, reducing fuel consumption and, as a result, GHG emissions. We believe that the path towards a sustainable change in the way shipping operates will come only through market-based incentives, aided by the **existing tools** that are currently available to all industries such as carbon pricing. Any global regulation alone would fail to police such a vast industry that operates under numerous jurisdictions and territories.

Industry Trends

Fuels

Shell's view on future decarbonization pathways is that shipping will use **multiple fuels** in what is sometimes called a 'poly-fuel' scenario. However, they believe that **liquid hydrogen** will have an advantage over other potential zero-emission fuels for shipping, with higher potentials for success.

For **biofuels**, Shell shares the view that these can play a valuable role in the maritime sector over the decades ahead as a transition fuel. Biofuels can be blended with existing fuels and used in today's vessels and existing infrastructure. So, in this way, biofuels can be used in the engines of today's ships during the years it will take for these vessels to be fully phased out.

November ended with some interesting green fuel developments:

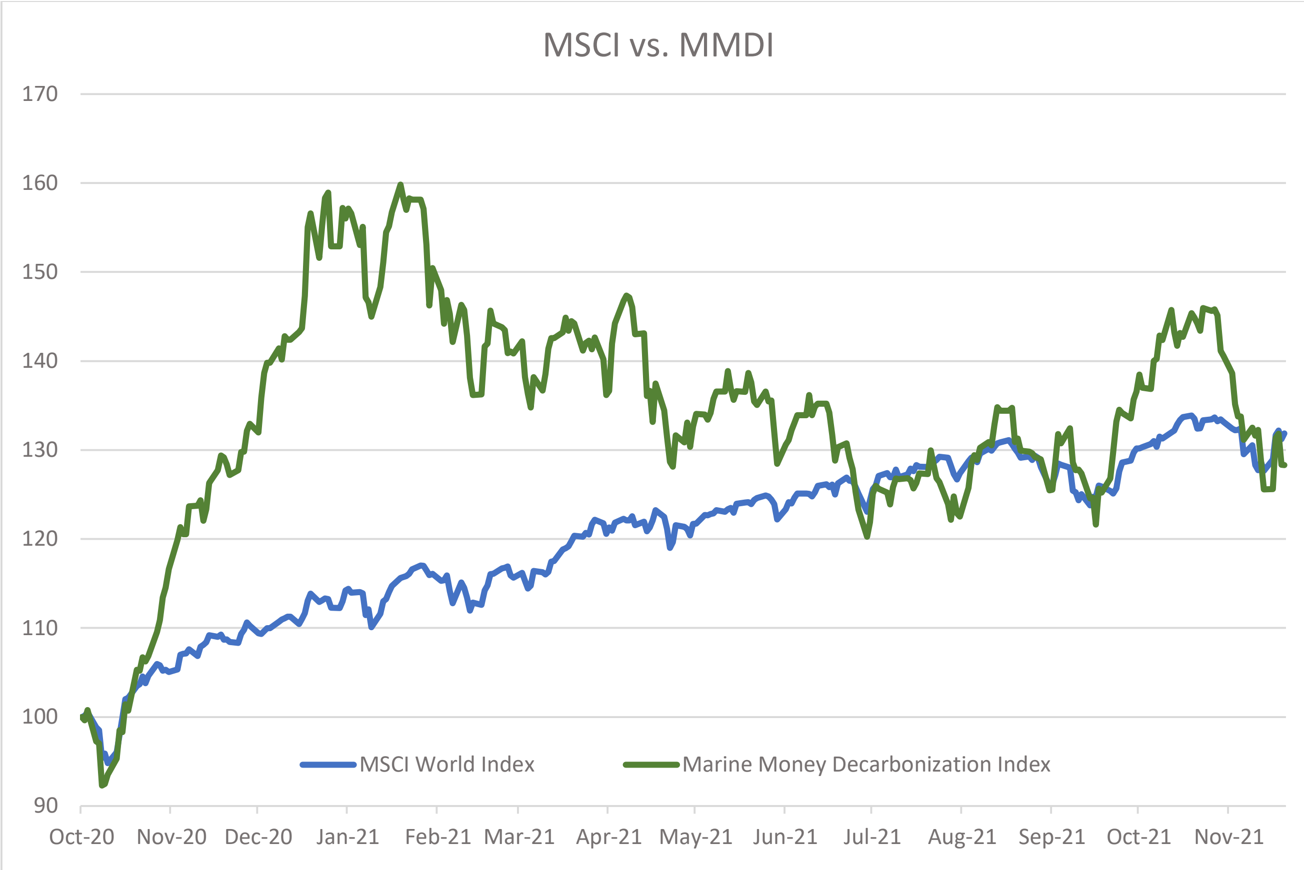
- **First Movers Coalition** launched to scale up green fuels: This is an initiative between the US State Department, through the Special Presidential Envoy for Climate, John Kerry, and the World Economic Forum to accelerate the adoption of clean energy technology in hard to abate industries. The only shipping company among the founding members is AP Moller–Maersk. From the cargo owning side founding members include Amazon, Apple, Trafigura, Fortescue Metals Group, and Yara International.
- MOU between **Shell** and **RWE Generation**: The aim is to jointly advance projects for the production, use and distribution of **green hydrogen**.
- French shipping major **CMA CGM Group** and compatriot utility company ENGIE have committed to working together on synthetic methane, Bio-LNG production.

Technology

- **Hydrogen** fueled engines remain on the spotlight for this month. Japanese shipping company **MOL** is working with **Japan Engine Corporation (J-ENG)**, part of the Mitsubishi Heavy Industries conglomerate, to get a low-speed, two-stroke **hydrogen-fueled marine engine** on one its geared bulk carriers. In addition, Swiss engine designer WinGD announced planned dates for ammonia and hydrogen engines for 2024 and 2025 respectively.
- One more interesting move in terms of engine's enhancement emerged from **Wartsila**. The Finnish technology group revealed plans to commercially launch its two-Stroke Future Fuels Conversion platform during the **first quarter of 2022**. The engine combustion technology platform will enable the fast and cost-effective conversion of two-stroke main engines to operate on clean-burning future fuels. The International Chamber of Shipping and the environmental consulting company Ricardo with a recently published report named 'A Zero Emission Blueprint for Shipping' stressed out the importance for a scaling up of finance for alternative fuels and technology.

Green Ships

The interest in CO2 carriers became very evident in November. In the LPG segment, **Mitsui OSK Lines** and **Mitsubishi** completed a concept study for a **large CO2 carrier** with a total cargo tank capacity of up to 50k cbm.



Relevant Prices

Fuel Prices	Price	YOY
Crude Oil, Brent	74.50 $/bbl	87.6%
Natural Gas, Henry Hub	3.81 $/MMbtu	47.1%
LNG, Korea/Japan	35.73 $/MMbtu	342.5%
Coal, Rotterdam	135 $/mt	111.8%
VLSFO, Rotterdam	379 $/mt	29.7%
Methanol, China	41.91 $/mt	13.3%
Palm Oil, Malaysia	49.38 $/mt	39.6%

Stock Indices		
Marine Money Decarbonization Index	385	-1.4%

Carbon Emission Allowances		
EU Emission Allowances	92.72 $/kt	169.1%
UK Emission Allowances	96.93 $/kt	62.0%

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

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