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Setting Sail Towards Zero Emissions in Shipping

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There has been significant progress over the past year towards the creation of a more sustainable shipping industry. After years of minimal regulatory change in the sector, both the International Maritime Organization (IMO) and major shipping companies have advanced pledges to decrease their environmental footprint. What will those changes mean for investment in the sector?

The shipping sector emits 1 billion tons of carbon dioxide per year, representing about 2.5 percent of global greenhouse gas (GHG) emissions. Cargo ships, which carry about 80 percent of global trade, are powered by bunker fuel—a thick, sulfur-laden petroleum distillate that is usually cheaper and dirtier than regular fuel. To put it in perspective: if it were a country, shipping would rank as the sixth largest GHG emitter in the world—higher than Germany—according to the International Council on Clean Transport.

Attempts to regulate the industry's emissions have historically faced opposition because of the importance of shipping to global trade and economic growth. The shipping industry, like aviation, was excluded from the 2015 Paris Climate Agreement partly due to the difficulty in attributing emissions to individual countries.

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But there was a breakthrough in April 2018. After years of negotiations, the IMO reached an agreement to cut the shipping industry's carbon emissions by at least half of 2008 levels by 2050.

Six months after that, 34 shipping industry leaders including executives from Cargill, Gaslog and AP Moller-Maersk committed to reduce carbon emissions by at least 50 percent by 2050. Their call to action also emphasized the need to ramp up technological and business model innovation to meet those goals.

AP Moller-Maersk, the largest container shipping company by capacity in the world, took it a step further in December 2018 when it announced plans to reduce net

carbon emissions to zero by 2050. Maersk's pledge also called for increased spending in research and development. Describing it as an "existential exercise" for the company, Sørren Toft, Maersk's COO, told the Financial Times that the entire supply chain of engine makers and shipbuilders need to contribute to find carbon-free options for shipping. "We will have to abandon fossil fuels. We will have to find a different type of fuel or a different way to power our assets," Toft said.

In-Demand Technology

This shift has opened up a new avenue for investment in eco-friendly technologies in the maritime sector. Many shipping companies and start-ups are actively searching for innovative solutions that tackle environmental costs. Some are examining new fuel sources such as liquefied natural gas (LNG), biogas made from fish, or hydrogen and ammonia, into which Maersk is reportedly looking. Others are experimenting with electric ships and battery-powered solutions, such as those being piloted for barges in Europe—the so-called "Tesla ships." Though battery-powered engines have been viable on the roads, no such solutions exist for deep sea vessels traveling long distances… yet. (There has been some progress on that front: China successfully tested a super battery that powered a 2,000 metric ton electric boat for 80 kilometers in 2017).

Other efforts at greening shipping have focused on efficiency, such as futuristic sails and other ship designs that reduce fuel use, although most of these innovations are still at the development stage and aren't yet operational. Finland's Norsepower and others are developing rotor sails to increase energy efficiency by providing auxiliary wind propulsion power. Maersk Tankers is testing Norsepower's sails on an oil tanker. However, although expected to reduce fuel use by 5-15 percent, rotor sails might not be suitable for all types of ships as they require clear decks to work and, depending on the design, may need to be retracted into a bulkhead in severe weather. For its part, Airbus is currently investing in the SeaWing, an automated kite that reduces shipping fuel costs by 20 percent. From 2021, Airbus said it plans to use the SeaWing on cargo ships that deliver its aircraft parts in Europe.

While the shipping industry is aiming for total decarbonization in the long term, a more immediate concern involves the IMO's sulfur cap. The new rule will ban ships from using fuels with a sulfur content above 0.5 precent unless they are equipped with scrubbers to clean up sulfur gas emissions. The current cap on sulfur, whose emissions have been linked to asthma and premature deaths, is at 3.5 percent, and the new rule is expected to affect 70,000 vessels globally. With the cap set to go into effect in January 2020, shipping firms are scrambling to either invest in scrubber technology, which removes the sulfur as the fuel burns, or get access to nearly sulfur-free fuel. Some countries, including the United States, have called for the cap to be phased in to give the industry more time to fully comply.

Investment Opportunities

The need for new technologies to make fleets more sustainable, as well as compliant with changing industry standards, has created investment opportunities in the green shipping space. In 2014, IFC, a member of the World Bank Group and a leading investor in emerging market transportation, provided the world's second largest container shipping

company, the Mediterranean Shipping Company (MSC), with a $150 million loan to increase operational efficiency and reduce fuel use. The project entailed retrofitting 140 vessels to improve the ships' hydrodynamics by replacing propellers and bulbous bows. Those changes reduced fuel consumption by 10-12 percent and saved an estimated 1.2 million to 1.5 million tons of CO_2 per year—the largest GHG reduction by an IFC investment to date.

A year later, IFC again supported MSC as it complied with the IMO's Ballast Water Management Convention, which established standards for the management of ships' ballast water, which is added to hulls for stability when traveling without cargo. That water is then released thousands of miles from where it was collected, sometimes resulting in the introduction of new species to foreign waters, with serious ecological and economic consequences. IFC's $70 million loan helped the company install 150 water treatment systems aboard its ships to stop the transfer of invasive species that can travel in ballast water. IFC's support helped MSC pursue an environmentally-motivated project faster than it could otherwise, allowing them to catalyze a trend in the industry by adopting IMO standards before they went into effect.

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Environmental standards and regulation will continue to drive investment and technological innovation in the shipping sector in the future, creating more opportunities for impact. This is why development institutions are stepping up their support of green shipping. In 2017, the European Investment Bank launched its Green Shipping Financing Programme, which provides facilities for environmentally-focused retrofits through European banks. The program's first deal was an investment in France-based Brittany Ferries' first LNG-powered ferry, which is scheduled to set sail in late 2019. There will be continuing opportunities to support the greening of the shipping sector in the years to come—including through fleet upgrades, LNG or LPG powered ships, scrubbers, and wind sail technologies that will be needed at scale across the sector as GHG abatement becomes the norm and as shipping keeps sailing toward zero emissions. ■