



SUMMARY REPORT

MARITIME MAKEOVER

The role for investors in decarbonizing global shipping

ESG BY EDF: INVESTOR INSIGHTS FOR A LOW CARBON WORLD

ESG By EDF is a suite of investor-oriented research products providing insights on transition issues in carbon-intensive sectors informed by EDF expertise in science, policy and industry.



Highlights

- **Maritime shipping is a hard-to-abate sector with significant carbon emissions.** Decarbonizing shipping, which is responsible for around 3% of global emissions, requires transitioning the industry from using oil-derived bunker fuel to a range of solutions, at the center of which are new zero-carbon fuels.
- **The industry is not on track for alignment with the Paris Agreement.** Fully decarbonizing shipping by 2050 is possible but will require that stakeholders take more ambitious steps to reduce fuel usage right away and accelerate the uptake of non-fossil fuels.
- **Shipping providers are just starting to focus on carbon.** Only 12 of the largest 94 ship owners have committed to a net zero target, a key first step toward transition planning. In the near term, ship owners and operators should adopt solutions that reduce fuel usage. Integrating zero-carbon fuels and technologies at increasing scales will accelerate the longer-term transition.
- **Shipping customers drive demand for low-carbon shipping.** Cargo owners and charterers should signal a willingness to pay for low-carbon supply chain services by prioritizing the use of low-emissions vessels.
- **Commitments and disclosures for shipping companies.** In this summary report we identify key “asks” for investors and lenders to make of shipping providers and shipping service users and recommend company-level disclosures.
- **Full report to be published in Summer 2022.** The upcoming full report includes background on key factors in the sector’s energy transition, including carbon reductions that can be achieved today, the cost and performance drivers of leading zero-carbon fuels, and a review of progress by 94 shipping companies toward a low-carbon transition.

Executive Summary

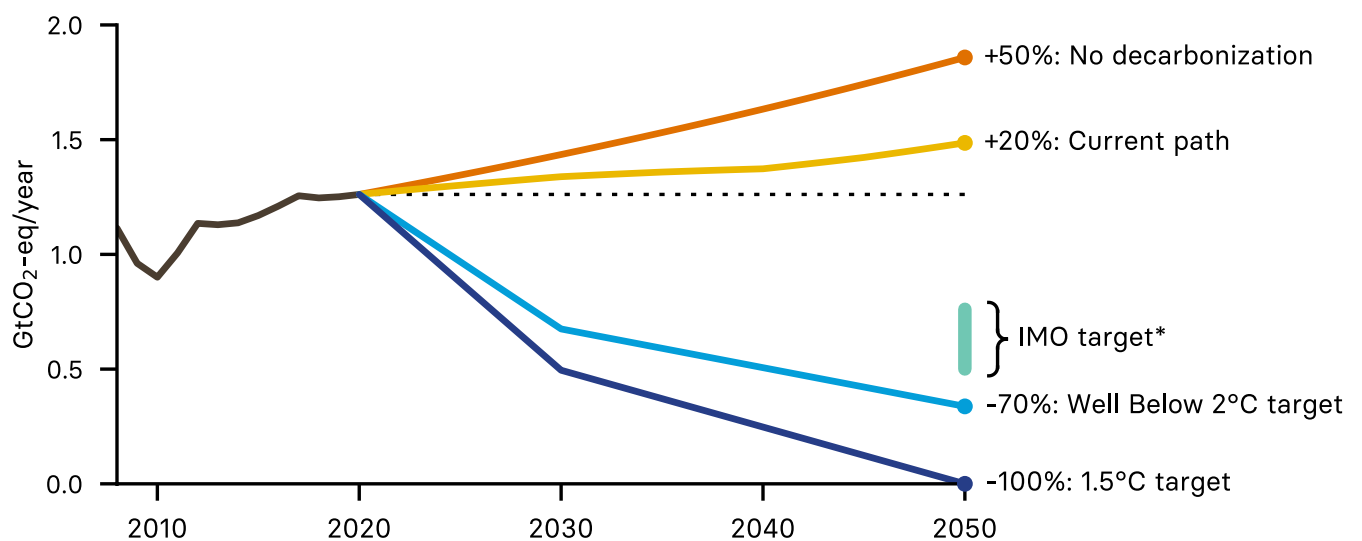
Maritime shipping occupies a [central position](#) in the global supply chain: nearly 100,000 commercial vessels move 11 billion tons of goods each year, accounting for about 80% of global trade volume. The associated greenhouse gas emissions add up, and shipping accounts for [about 3%](#) of global greenhouse gas emissions. If maritime shipping were a country, only 5 nations would emit more.

As globalization continues to drive rapid growth in shipping demand, emissions from the sector could [increase 20% by 2050](#) – a trajectory incompatible with pathways that limit global warming to the Paris Agreement targets of 1.5 degrees or well below 2 degrees Celsius (Figure 1). For investors with net zero targets, addressing shipping-related emissions will be necessary to reach them.

Analysis by the MMM Center for Zero Carbon Shipping shows there are [plausible pathways](#) to fully decarbonize shipping by 2050. These require that stakeholders take more ambitious action now to accelerate the adoption curve for low-carbon fuels. In contrast with areas such as electricity generation and passenger vehicles where zero-emissions technologies are available and increasingly competitive, solutions for maritime shipping are less mature. By taking steps now to test and de-risk new fuel pathways, stakeholders can reduce long-term costs and manage the risk of price or fuel supply shocks in the future.

FIGURE 1

Maritime emissions pathways



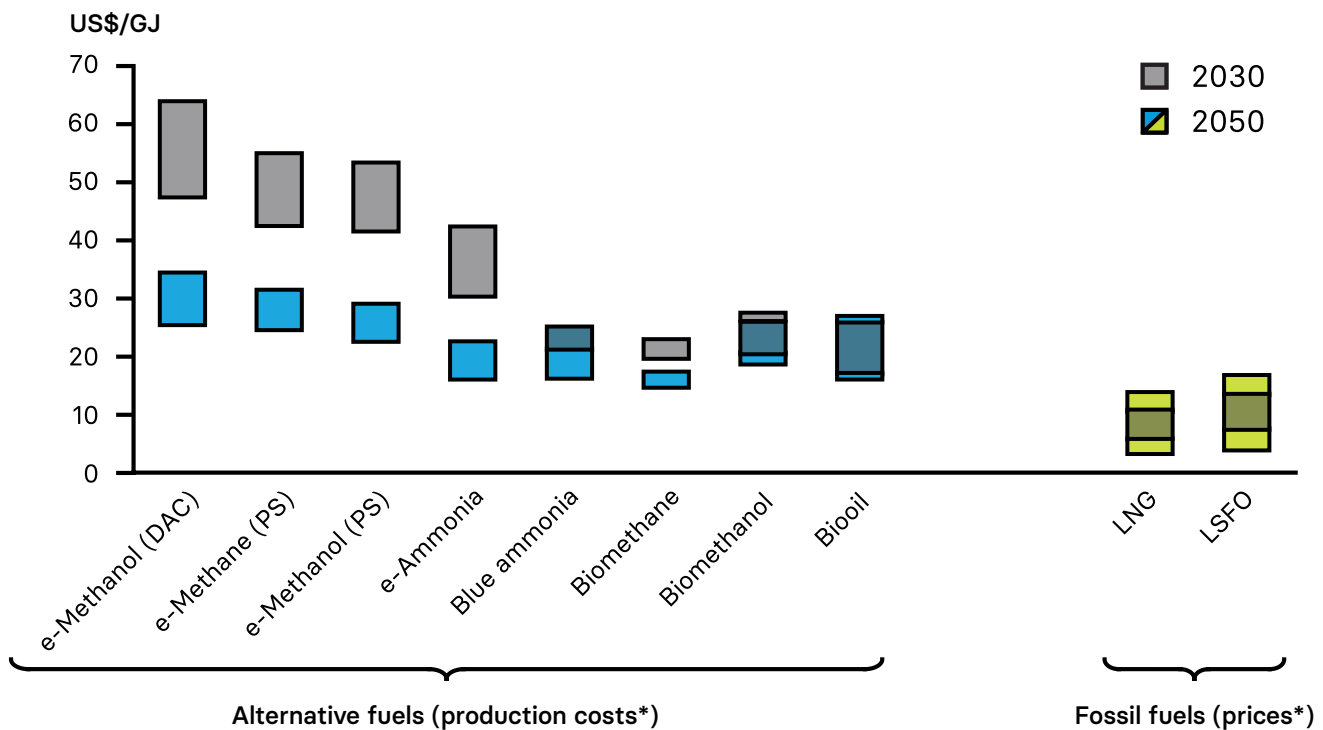
* The IMO target of reductions in shipping emissions by at least 50% by 2050, compared with 2008 levels is shown as an indicative range but is not directly comparable to the other pathways because 1) it uses a 2008 baseline and 2) unlike the other pathways pictured it excludes upstream emissions associated with fuel production.

Ambitious policy leadership can also reduce transition costs by helping to organize the market. Policy authority is diffused among the International Maritime Organization (IMO) - the global standard-setting authority for the international shipping industry - and the many countries across which global shipping companies operate. In its most recent [strategy](#) the IMO calls for emissions to peak “as soon as possible” and begin to decline; engagement by investors and others on zero-by-2050 climate targets can help achieve these goals.

Measures offering significant emissions reductions are available today, and shipping companies should adopt them. However, dramatic emissions reductions will require transitioning the global industry from using oil-derived bunker fuel to alternative non-fossil fuels such as ammonia, methanol, biomethane or bio-oil that are not yet widely available. A range of such fuels are in various stages of development and demonstration; some are “drop-in” fuels compatible with existing vessels, while others require engine or vessel modifications.

Alternative fuel costs are expected to fall significantly in the coming years but current projections suggest they will remain more expensive than fossil-based fuels well into the future (Figure 2). There are differences in the performance, cost, operational capabilities and scalability of these potential fuel solutions and a single winner has not emerged; rather, it’s likely that the industry will rely on a variety of fuels, adding complexity to the transition.

FIGURE 2
Projected Maritime Shipping Fuel Costs



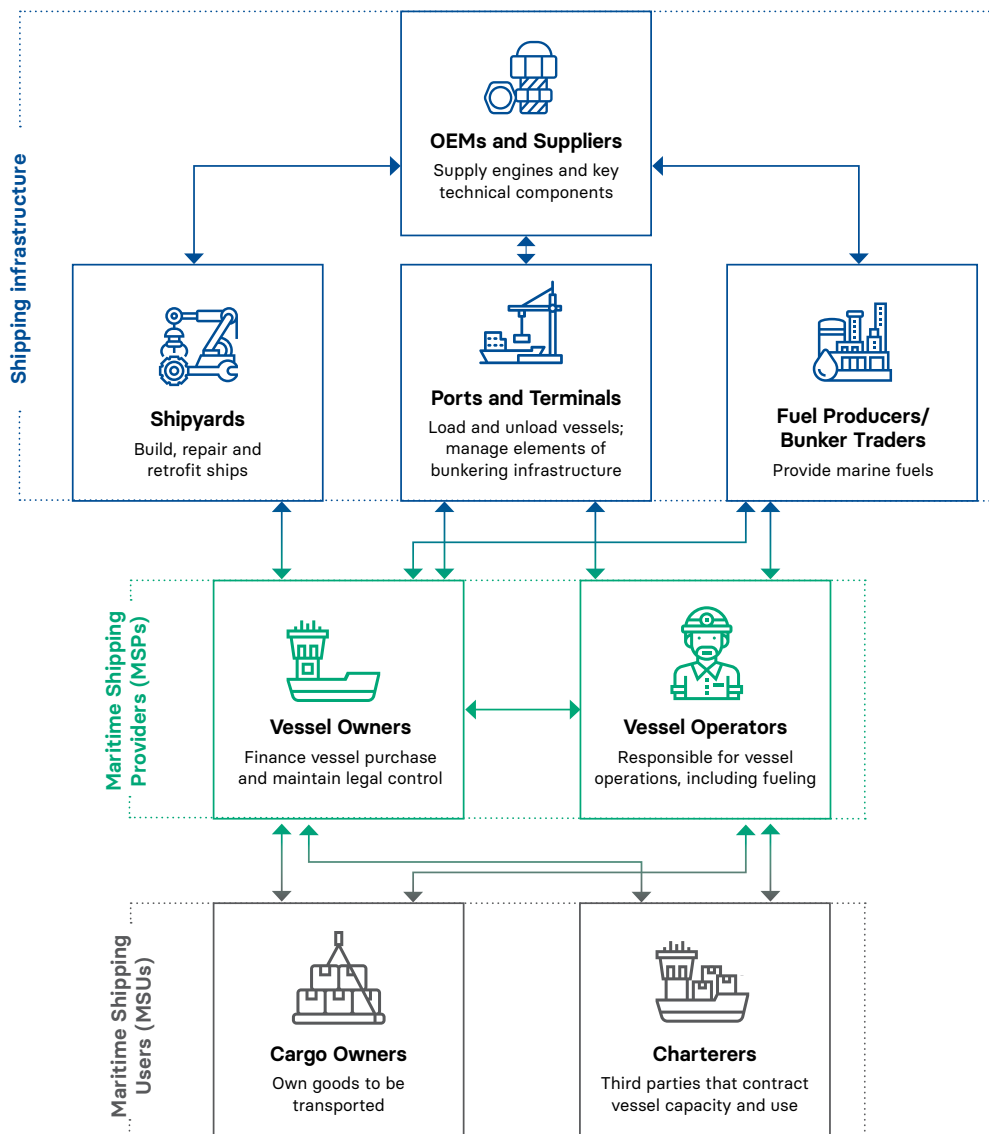
**Excludes future subsidies and/or cost of carbon*

Source: MMM Center for Zero Carbon Shipping

To lay the groundwork for introducing alternative fuels at scale, stakeholders including shipbuilders, ship owners and operators, ports, fuel providers and shipping customers must work together to address technical, logistical and institutional barriers. Given the many parties involved, close coordination is needed to deploy and expand these solutions, aligning factors such as shipbuilding timeframes, the deployment of new vessels, and cost/willingness to pay (Figure 3).

Some leaders in the maritime shipping industry have committed to a low-carbon transition and begun to chart a path to achieve it. Twelve of the largest 94 ship owners have set a net zero target, and dozens more have adopted emissions reduction goals. Many more should follow. Waiting too long to begin the transition exposes a company to significant technological, financial and reputational risk.

FIGURE 3
Select shipping industry stakeholders



Investors have an important role to play in pushing companies that provide or use maritime shipping services to set ambitious decarbonization targets, and holding them accountable to achieve them.

In this summary report we identify specific commitments that investors should ask of providers and users of maritime shipping services on the path to zero-emissions by 2050, and we recommend disclosures to measure progress. A forthcoming full report includes background on key factors in the sector's energy transition, including carbon reductions that can be achieved today and the cost and performance drivers behind leading zero-carbon fuels. It also includes a review of 94 shipping companies and steps they have taken towards a low-carbon transition.

The ask: How key players in shipping can drive emissions reductions

Among the many players with a role in the maritime sector, two types of market participants play a central role influencing the pace of decarbonization. These are: ship owners and operators, referred to in this report as **maritime shipping providers (MSPs)**, and users of shipping such as cargo owners and charterers, referred to as **maritime shipping users (MSUs)**. Each has key leverage over the sector's energy transition thanks to its central placement in the network of shipping operations and shipping demand, respectively (see Figure 3).

Given the importance of maritime shipping to global supply chains, investors should ask both MSPs and MSUs to make clear commitments to emissions reduction including concrete short, medium and long-term steps. Companies should also disclose relevant metrics that allow stakeholders to measure progress toward those goals.

Commitments from Maritime Shipping Providers (MSPs)

Based on our analysis of shipping industry decarbonization and the interaction of market participants, we identified the following key commitments that investors should ask of MSPs. These will not be equally relevant to all MSPs and will vary depending on company-specific dynamics such as whether a company owns or operates ships.

- 1. Commit to reach zero-emission shipping by 2050.** Companies should set a target to eliminate emissions of carbon dioxide and other greenhouse gases based on a full fuel lifecycle accounting by 2050 or sooner. Some leading companies have set targets to decarbonize by 2040.
- 2. Adopt interim emissions reduction targets consistent with long term goals.** Credible decarbonization plans include immediate reductions in carbon intensity, not postponing significant emissions cuts to later years. The Science Based Targets initiative's [guidance](#) for a 30% reduction in absolute emissions from 2020 to 2030 is a good starting point. Interim targets should address:
 - a. Carbon intensity targets.** MSPs should set near- and medium-term targets for declining GHG intensity (in g CO₂/dwt/nm or a similar metric) and report annually on investments and progress towards those goals. In the near term, MSPs should upgrade their fleets so that by 2024 all vessels achieve a rating of at least "C" in the IMO Carbon Intensity Indicator system that takes effect in 2023; by 2025 all vessels should achieve an "A" or "B" efficiency rating.

- b. **Fuel strategy.** MSPs should develop long-term and transitional fuel strategies, addressing factors such as demand projections and infrastructure needs. Where companies have already implemented LNG or biofuel blending as a near-term strategy, they should address how they will transition fully to zero-carbon fuels, consistent with their target.
 - c. **Ship purchase and upgrade strategy.** MSPs should adopt fleet transition plans encompassing both new-build and vessel retrofits that establish a path to full fleet decarbonization including short-, medium- and long-term goals and fuel strategies.
 - c. **Energy efficiency measures.** Increasing vessels' fuel efficiency is a readily available, cost-effective means to reduce fuel consumption and associated emissions. The options depend on vessel type and operational profile. They include technical measures such as hull and propeller optimization; alternative propulsion systems such as wind-assist; and operational efficiency measures such as route optimization and speed reductions.
3. **Provide cargo-level emissions data.** Companies should disclose emissions per ton (or TEU) of cargo transported per distance carried. They should work toward providing customers with emissions data per cargo unit – including lifecycle CO₂ and non-CO₂ GHGs and emissions – to support supply chain emissions management.
 4. **Support the development of “green” ports and corridors.** Pilot programs and early learning opportunities centered on port electrification and carbon-free shipping corridors are important to accelerate the deployment of new technologies at scale.
 5. **Advocate for clean shipping policies at international, regional and local levels.** Strong policy support for clean shipping can reduce costs associated with the transition while accelerating decarbonization. MSPs should directly engage in the development and support of ambitious policies to advance the transition. Notably, companies should encourage the IMO to adopt zero-by-2050 emissions reduction targets in the forthcoming revision of its GHG strategy.

Commitments from Maritime Shipping Users (MSUs)

Based on analysis of shipping decarbonization and the interaction of market participants, the following are key commitments that investors should ask of MSUs with respect to their use of maritime freight.

1. **Prioritize climate performance in shipping procurement.** Seek out providers with zero-emission targets, explicit transition plans, ongoing or committed emissions reductions, and other indicators of leadership in the energy transition. This could include committing to ship a minimum share of freight with MSPs that have explicit decarbonization targets. Engage directly with MSPs to understand their transition plans and encourage ambition.
2. **Place cargos on the cleanest, most fuel-efficient vessels possible.** Preferencing ships with an IMO rating of “A” or “B” can drive near-term emissions reductions and support corporate scope 3 goals.
3. **Signal a willingness to pay more for zero-carbon shipping services.** In the initial years of the transition, zero-carbon fuels will be more expensive than traditional fossil fuels; MSUs should communicate their willingness to pay a premium for their use.

- 4. Support the development of “green corridors” and commit to using them when they become available.** Demand from shipping customers is important to justify early investments in alternative-fuel ships and infrastructure. By participating in such green corridors, MSUs can accelerate their deployment at scale.
- 5. Advocate for clean shipping policies at international, regional and local levels.** MSUs should directly engage in the development and support of ambitious policies to drive the sector's transition. Companies should encourage the IMO to adopt zero-by-2050 emissions reduction targets in the forthcoming revision of its GHG strategy. Policies that lower the expected price gap between scalable zero-emission fuels and fossil fuels are also of particular importance.

Disclosures

In order to evaluate individual company performance and compare one company to another, investors need consistent and comparable disclosures of emissions performance. The global nature of the maritime shipping industry makes the IMO the logical source of such disclosure standards; however, key elements of IMO-required emissions disclosures are not attributed to individual companies. Shipping companies that report emissions do so voluntarily or according to local requirements, leading to a range of disclosure formats.

Disclosures from Maritime Shipping Providers (MSPs)

The Sustainable Accounting Standards Board's Marine Transportation Standard, which has now been included in the International Financial Reporting Standards Foundation's new [draft sustainability standard](#), recommends several helpful metrics for MSPs. However, we believe that companies should go beyond these metrics to provide further disclosures that investors can use to evaluate progress towards climate goals. These are:

- 1. GHG emissions.** Companies should disclose scope 1, 2 and 3 emissions and identify which are related to shipping.
- 2. Fuel mix.** Disclosure should include the total energy consumed as well as the percent split in energy consumption between heavy fuel oil and other fuels such as natural gas and, as they are introduced, low-carbon alternative fuels.
- 3. Carbon intensity.** This should be expressed at the fleet level in g CO₂/dwt/nm or a similar metric and complemented at the vessel level with the IMO carbon intensity indicator letter grade when those become available in 2023.
- 4. Average Energy Efficiency Design Index for new ships.** This IMO measure, expressed in gCO₂/TNM, is an indicator of whether capex for new ships is being deployed in a way to minimize emissions intensity.
- 5. Climate strategy and progress on transition.** MSPs should provide a discussion of their emissions targets and transition plans, as well as an analysis of performance against those targets. This could include, for example, zero-carbon capex plans or the number of cargo-miles shipped via green corridors or on zero-carbon vessels.

Conclusion

The shipping industry is in the early stages of addressing its climate emissions and is not on track to reach zero carbon by 2050. This presents climate-related transition risk for investors. To reduce portfolio emissions, investors should call on providers and users of shipping services to adopt transition plans. These plans should include near-term operational changes to reduce fuel use, accelerated learning on alternative fuels, clear targets along the path to full decarbonization, and advocacy for policies that increase the speed of the transition and reduce its cost.

This summary report and the forthcoming full report are co-authored and published by Environmental Defense Fund and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping.

Learn more about [ESG by EDF](#).

