# Drivers for decarbonization

# 3 DRIVERS FOR REDUCING GREENHOUSE GASES FROM SHIPPING

This chapter of the Handbook focuses on GHG emissions as a key sustainability issue and discusses the key drivers for decarbonizing marine transport, namely regulations, and expectations from the financial sector and cargo owners. Taken together, uncertainty over future regulatory change and other drivers, and the uncertain development of fuel and technology options, mean that shipowners considering newbuilding orders today face a complex carbon-risk picture. In this rapidly changing landscape, it is important to keep up to date with the latest decarbonization drivers.

The expected tightening of regulations in the years to come is driving decarbonization as shipowners must plan for lifecycle compliance. A ship that is compliant today is not necessarily so a few years down the road, which represents a significant financial risk. DNV GL (2020b), KLP, DNB, DNV (2021), and DNV (2021b) measured the financial risk and performance for different engine technologies under different regulation scenarios and showed that investments in conventional engine technologies yield weak financial returns in strict regulatory environments.

As outlined in the previous chapter, GHG emissions is arguably the most compromising element of a ship's sustainability and ESG performance. Shipping is under a lot of pressure to reduce its GHG footprint, which continues to grow. A range of different private and public actors have promoted initiatives and structures which serve as drivers for shipping's eventual decarbonization of shipping. Pressure is exerted by many different actors; but in principle, we expect that three fundamental key drivers will push shipping decarbonization over the current decade (DNV, 2021a): regulations and policies; access to investors and capital; and cargo owner and consumer expectations (Figure 3-1).

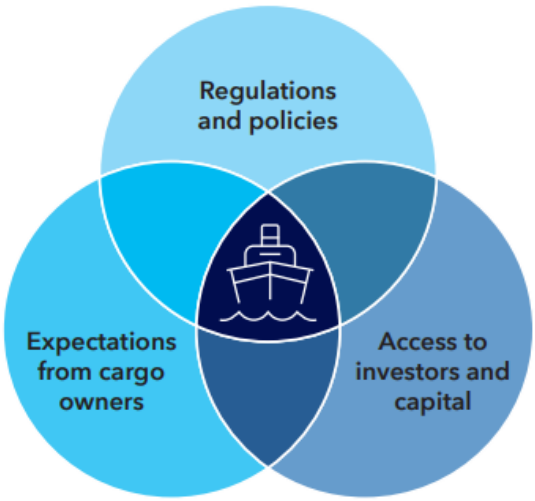


**Figure 3-1 Key drivers influencing ship decarbonization (DNV, 2021a).**

These three key drivers can incentivize decarbonization in different ways. Regulations and policies will place direct requirements on ships and shipping companies. Expectations from cargo owners, and access to investors and capital, will benefit environmentally friendly shipping; for example, through higher chartering fees, or access to low-cost financing. Behind all three drivers is the more climate-conscious behaviour affecting the way people act as consumers, voters, and investors, caused by the increased public awareness of climate change. Figure 3-2 shows some decarbonization milestones for key actors, which will be elaborated on in the subsequent subchapters.

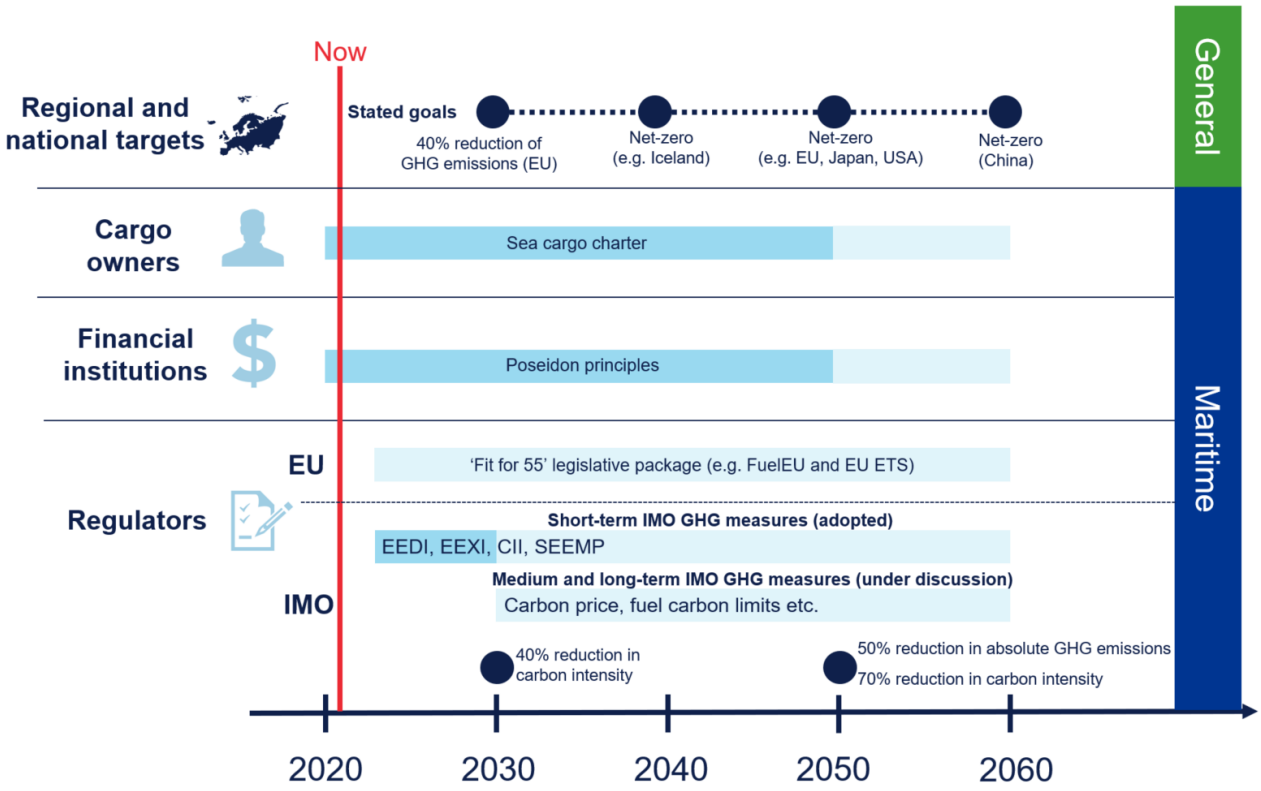


**Figure 3-2 Timeline for decarbonization regulations and initiatives, and milestones for GHG targets. Inspired by DNV (2021a).**

## 3.1 Regulations and policies

Government policies such as regulations remain a key driver for decarbonization, imposing direct requirements on ships and shipping companies. The most influential regulator for shipping is the IMO, with its concrete ambitions of at least halving absolute GHG emissions by 2050 compared with in 2008, in addition to reducing carbon intensity by 70%. Regional and national regulators are also entering the scene increasingly.

### 3.1.1 Global regulations – the IMO

#### 3.1.1.1 Short-term policy measures

Extensive new $CO_2$ regulations applying to existing ships were adopted in June 2021. They are the Energy Efficiency Existing Ship Index (EEXI), the Carbon Intensity Indicator (CII) rating scheme, and the enhanced Ship Energy Efficiency Management Plan (SEEMP). These measures, along with already existing Energy Efficiency Design Index (EEDI), are designed to meet the target of achieving a 40% reduction in carbon intensity for shipping by 2030 relative to 2008 and are described in more detail below.

The policy measures adopted by the IMO to regulate GHG emissions from shipping may be divided into *technical*, *operational*, and those applicable for *newbuilds* and *ships in operation* (Figure 3-3). The technical policy measures (EEDI and EEXI) relate to technical design parameters for a given ship in a defined design condition. Operational policy measures (CII rating and enhanced SEEMP), on the other hand, reflect the actual operation of the vessel.

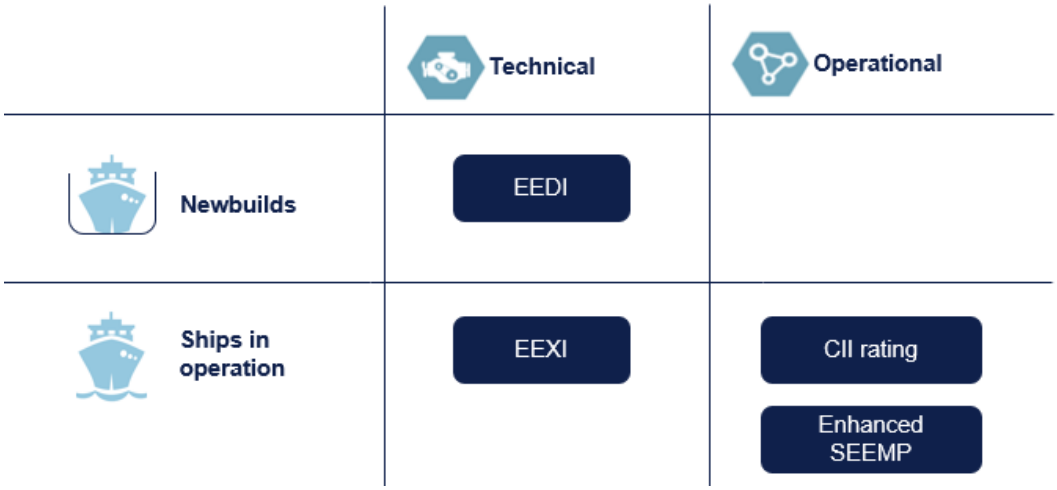


**Figure 3-3 Currently adopted international policy measures to regulate GHG emissions from shipping.**

EEDI, EEXI, CII, and enhanced SEEMP requirements are applicable for different ship types and sizes (Table 3-1).

**Table 3-1 Vessel types and sizes subject to EEDI and EEXI reduction requirements, and CII rating and enhanced SEEMP.**

| Ship type/characteristics | | EEDI and EEXI | CII rating and enhanced SEEMP |
|---|---|---|---|
| Conventional propulsion[12] | Bulk carrier | >= 10 000 DWT | >= 5 000 GT |
| | Gas carrier | >= 2 000 DWT | >= 5 000 GT |
| | Tanker | >= 4 000 DWT | >= 5 000 GT |
| | Containership | >= 10 000 DWT | >= 5 000 GT |
| | General cargo ship (except livestock carrier, barge carrier, heavy load carrier, yacht carrier, nuclear fuel carrier) | >= 3 000 DWT | >= 5 000 GT |
| | Refrigerated cargo carrier | >= 3 000 DWT | >= 5 000 GT |
| | Combination carrier | >= 4 000 DWT | >= 5 000 GT |
| | Ro-ro vehicle carrier | >= 10 000 DWT | >= 5 000 GT |
| | Ro-ro cargo ship | >= 1 000 DWT | >= 5 000 GT |
| | Ro-ro passenger ship | >= 250+ DWT and >=400 GT | >= 5 000 GT |
| | Cruise ship | N/A | >= 5 000 GT |
| | Passenger ship (except ro-ro passenger and cruise) | N/A | N/A |
| | Other ship with conventional propulsion, (e.g. heavy load carrier, livestock carrier, offshore) | N/A | N/A |
| LNG carrier with any propulsion system | | >= 10 000 DWT | >= 5 000 GT |
| Cruise ship with non-conventional propulsion | | >= 25 000 GT | >= 5 000 GT |
| Livestock carrier, barge carrier, heavy load carrier, yacht carrier, nuclear fuel carrier and passenger ship with non-conventional propulsion, and Category 'A' Polar Code ship | | N/A | N/A |
| Other ship with non-conventional propulsion | | N/A | N/A |
| Platforms including FPSOs and FSUs and drilling rigs | | N/A | N/A |

[12] MARPOL Annex VI defines conventional propulsion as a method of propulsion where a main reciprocating internal combustion engine(s) is the prime mover and coupled to a propulsion shaft either directly or through a gear box.

More information on each requirement is given below.

**EEDI**

EEDI is a technical requirement applicable for newbuild vessels since 2013. It requires a minimum level of energy efficiency (or maximum level of $CO_2$ emissions) per capacity mile (e.g. dwt-mile). EEDI is calculated based on a formula using the technical design parameters for a given ship. Figure 3-4 shows the main factors for calculating EEDI. Namely, the installed power on board the vessel (for the main engine and auxiliary engines), the specific fuel consumption for propulsion and auxiliaries, the $CO_2$ factor of fuel being applied, as well as design speed (i.e. attained speed of design at a given design condition) and deadweight.


**Figure 3-4 Main factors for calculation of EEDI (simplified). kW: Kilowatts.**

The required EEDI for a vessel is a function of deadweight, with larger vessels having stricter targets (quantitively). The requirements are to be tightened incrementally every five years in phases that started with an initial Phase 0. Newbuilds are now progressing to reaching Phase 3 between 1 April 2022 and 1 January 2025, depending on ship type (Table 3-2). EEDI requirements are given relative to a reference line, calculated from technical parameters for newbuild ships greater than 400 GT delivered in the 10 years to 1 January 2009[13].

**Table 3-2 EEDI-phases and reduction factors.**

| Phase | Applicable to ships built in the period | | EEDI reduction factor relative to reference line (%) |
|---|---|---|---|
| | from… | to… | |
| 0 | 1 January 2013 | 31 December 2014 | 0 |
| 1 | 1 January 2015 | 31 December 2019 | Up to 10% |
| 2 | 1 January 2020 | 31 December 2024 | Up to 20% |
| 3 | 1 April 2022 or 1 January 2025, depending on ship type) | N/A | Up to 50% |

In addition to the upcoming EEDI Phase 3, a Phase 4 is likely to be introduced later this decade, further tightening requirements for newbuilds.

[13] For Ro-ro cargo and Ro-ro passenger ships, technical parameters for ships delivered in the period 1 January 1998 to 1 January 2010 are used.

### EEXI

EEXI is a technical requirement that will be applicable for vessels in operation from 2023. It will impose a requirement equivalent to EEDI Phase 2 or 3 (with some adjustments) to all existing ships (see example for container vessels in Figure 3-5). The scope is the same ship types and sizes to which the EEDI applies but includes all ships regardless of the year of build. It is a one-off certification, and the attained EEXI is to be verified, and a new Energy Efficiency Certificate issued, no later than the first annual survey on or after 1 January 2023.

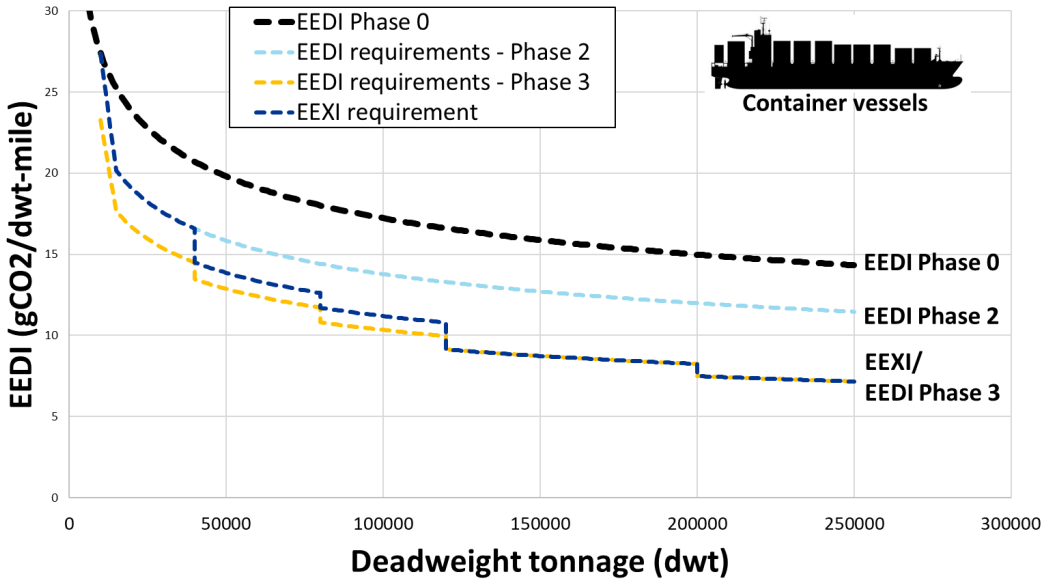


**Figure 3-5 EEXI requirement and comparison with EEDI for container vessels.**

### CII rating

CII (Carbon Intensity Indicator) rating is an operational requirement that will be applicable for ships in operation from 2023. All cargo, RoPax and cruise ships greater than 5,000 GT will need to calculate a CII, and will be assigned an annual rating of A to E. The rating thresholds will be set relative to a 2019 baseline and will be increasingly stringent towards 2030 (Figure 3-6). Adopted GHG emissions reduction requirements cover the period leading up to 2026, with an 11% reduction in 2026 relative to the CII reference line. This reduction requirement is relative to the mid-point of the C-rating band. Typically, the A-rating is 10% to 20% lower than the mid-point of the C-rating band. For ships that achieve a D-rating for three consecutive years, or an E rating in a single year, a corrective actions plan needs to be developed as part of the SEEMP and approved.

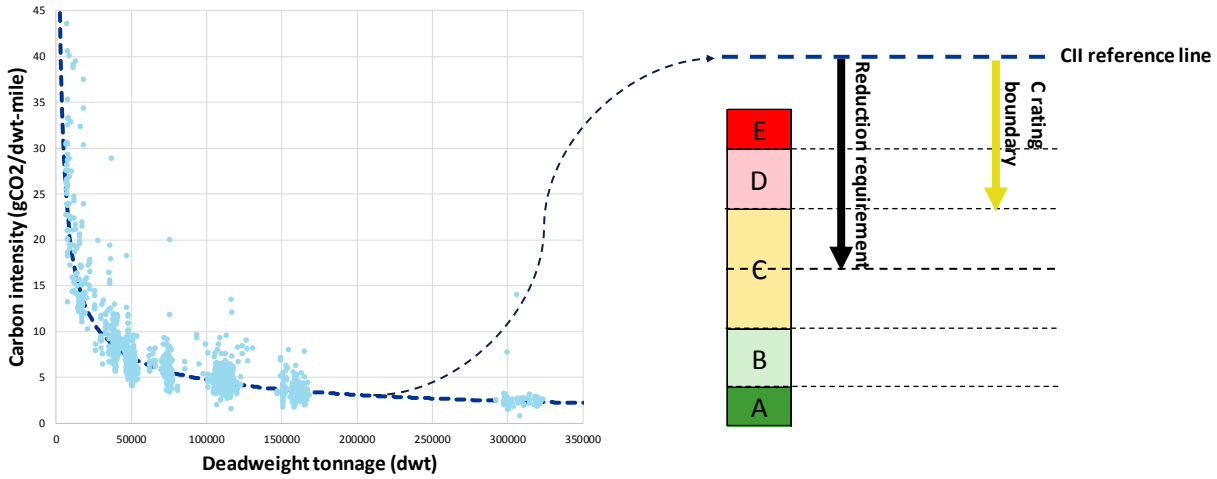


**Figure 3-6 Reference line and rating thresholds for CII. Example for oil tankers.**

Calculation of CII for individual ships is based on the IMO Data-collection System (DCS), requiring ships above 5,000 GT trading globally to report fuel consumption, hours underway, and distance travelled on an annual basis. It is a measure of annual $CO_2$ emissions per transport work capacity and is calculated from the formula in Figure 3-7. The calculation of CII is to be improved through correction factors and voyage exclusions, to be developed in 2022.


**Figure 3-7 Calculation of CII. Correction factors and voyage exclusions to be developed in 2022.**

A review of the CII rating requirements is to be conducted before 2026, and it cannot be ruled out that, in the future, a different measure for carbon intensity will be used for CII rating requirements, e.g. Energy Efficiency Operating Index (EEOI). Rather than calculating carbon intensity in terms of $gCO_2$/capacity-mile, EEOI considers the actual cargo carried by the vessel. Currently though, IMO DCS-data does not collect any information related to the cargo carried by a vessel, and such information would need to be collected and verified before being implemented into IMO policy measures.

### Enhanced SEEMP

Enhanced SEEMP is an operational requirement applicable for vessels in operation by 1 January 2023. All ships subject to the CII requirements need to keep on board an approved SEEMP which must include mandatory content, such as an implementation plan on how to achieve the CII targets. The implementation of the SEEMP will also be subject to company audits, although the specific requirements to the audit are still under development and are expected to be approved by the IMO in June 2022.

#### 3.1.1.2 Mid- and long-term policy measures

While the currently adopted short-term policy measures (EEDI, EEXI, CII, and SEEMP) may become increasingly stringent as time passes, other policy measures are also assessed to help regulate GHG emissions from shipping to achieve the IMO GHG reduction targets. It is widely acknowledged that alternative fuels will be more expensive than conventional fuels, and that a set of financial incentives or technical regulatory requirements could be necessary to achieve a significant uptake of environmentally friendly solutions. These tools could include market-based measures (MBMs), or carbon pricing, including levies, taxes, and cap-and-trade schemes, along with technical and operational requirements such as fuel carbon limits and alternative fuel drop-in requirements. There are two main variants of MBMs: introduction of a carbon levy or tax, implying a fixed price on emissions; or, introduction of a cap-and-trade scheme, implying a cap on emissions and a floating price. Prior to the June 2021 meeting of the IMO's Maritime Environment Protection Committee (MEPC 76), several submissions were raising these topics.

MBMs is on the list of candidates for mid-term measures outlined in the IMO's Initial GHG Strategy (IMO, 2018), and implementation of such measures could be agreed by the IMO between 2023 and 2030. However, the process towards implementation is expected to be lengthy. A reasonable assumption is therefore that any form of carbon pricing scheme from the IMO cannot be implemented before the latter half of this decade due to political and practical issues (DNV GL, 2020b).

Countries[14] and industry organizations[15] have made submissions to the IMO arguing for a rapid introduction of a carbon levy. Individual industry stakeholders have also voiced support for carbon levy schemes. For example, Maersk[16] has proposed a carbon price ramping up from USD 50 to USD 150 per tonne of carbon dioxide ($tCO_2$). Determination of a suitable price level could be approached from different angles; for example, it could be based on the Paris Agreement targets, or on the required price to levelize the cost of alternative fuels. Naturally, results will differ depending on the angle. OECD estimates that a carbon price of EUR 120 per $tCO_2$ is needed in 2030 to decarbonize by mid-century (OECD, 2021). While this Paris-aligned estimate is industry-generic, the major ship charterer Trafigura approaches the question from the levelized fuel cost angle. It proposes that the IMO introduces a carbon levy of between USD 250 and USD 300 per $tCO_2$ to make zero- and low-carbon fuels more competitive (Trafigura, 2020). Status on carbon price uptake and level can be found in the OECD report (OECD, 2021), and from the World Bank's Carbon Pricing Dashboard[17].

Several proposals regarding emissions cap-and-trade schemes, the second variant of MBMs, have also been submitted to the IMO[18]. One of the main benefits of this approach is that since the absolute emission allowed (the emission cap) is regulated, a high degree of certainty of reaching a certain reduction target can be obtained, and the decarbonization target trajectory can be met as the number of allowances decrease over time.

As an alternative, or addition, to setting a carbon price and letting market forces drive down emissions, fuel GHG/$CO_2$ levels per unit of energy used could be regulated. According to submissions made on the topic[19], this measure can resemble the global sulphur cap introduced in 2020, essentially setting a hard limit to how much GHG/$CO_2$ the fuel can release from combustion. This could also include well-to-tank emissions. For $CO_2$/GHG, this model will potentially require some more flexibility; for example, by allowing fleet averaging, meaning that a low-emissions fuel burned on one vessel can offset a worse-performing fuel burned on another within a defined fleet.

[14] See for example MEPC 76/7/12, Proposal for IMO to establish a universal mandatory greenhouse gas levy, submitted by Marshall Island and Solomon Islands

[15] See for example MEPC 76/7/39, *Consideration of market-based measure*, submitted by ICS, BIMCO, CLIA, INTERCARGO, IPTA, IMCA, INTERFERRY and WSC

[16] https://www.bloomberg.com/news/articles/2021-06-02/shipping-giant-maersk-seeks-150-a-ton-carbon-tax-on-ship-fuel

[17] https://carbonpricingdashboard.worldbank.org/resources

[18] See for example MEPC 76-7-2, *Concepts for a regulatory mechanism for the effective uptake of alternative low-carbon and zero-carbon fuels* submitted by Norway. See also MEPC 76-7-15, *The importance of starting work on mid-term GHG reduction measures that incentivize the use of sustainable low-carbon and zero-carbon fuels in international shipping*, submitted by Denmark, France, Germany, and Sweden.

[19] See MEPC 76-7-2, *Concepts for a regulatory mechanism for the effective uptake of alternative low-carbon and zero-carbon fuels*, submitted by Norway. See also MEPC 76-7-15, *The importance of starting work on mid-term GHG reduction measures that incentivize the use of sustainable low-carbon and zero-carbon fuels in international shipping,* submitted by Denmark, France, Germany, and Sweden.

Current IMO regulations only address onboard tank-to-propeller emissions of carbon dioxide. In order to incentivize uptake of alternative fuels in the future, it will be important that carbon-based biofuels and electrofuels are credited with GHG emissions reduction, even though they have tank-to-wake $CO_2$ emissions that are comparable to fossil fuels. Towards this end, it will be important to consider the lifecycle perspective of fuels. It is also important to consider other GHGs such as nitrous oxide ($N_2O$) and methane ($CH_4$). Discussions are currently ongoing in the IMO for how lifecycle GHG emissions of marine fuels can be addressed in regulations[20].

### 3.1.2 Regional

Beyond the IMO, the EU is one of the most influential and ambitious regulators. Its ambition is to reduce the Union's total sector-independent emissions by 55% by 2030, relative to 1990, and to become climate-neutral by 2050. In July 2021, the EU presented its 'Fit for 55' legislative package, which among other things propose to extend the EU Emissions Trading System (EU ETS) to also include maritime transport, and to introduce the FuelEU Maritime Initiative, which aims to increase the use of sustainable fuels.

The EU ETS for shipping is proposed to apply to 50% of emissions from voyages between EU and non-EU ports (both in- and outbound), and to 100% of $CO_2$ emissions from intra-EU voyages and when at berth in an EU port. The FuelEU Maritime Initiative is proposed to apply to 50% of energy used on inbound and outbound EU voyages, and to 100% of energy used on intra-EU voyages and when at berth in an EU port. The EU Council and Parliament will consider the draft proposals before final adoption.

Recently, major countries have also announced concrete targets. China has set a target to be carbon-neutral by 2060; the US aims to reduce GHG emissions by 50% by 2030 relative to 2005, while Japan and Canada have a similar timeline for a 40% to 45% reduction. These ambitions should be expected to impact shipping through national and international policies and action plans, which will stimulate incentives and activities to develop and implement new solutions. This is already the case in Norway, where the target of reducing GHG emissions by at least 50% by 2030 compared with 1990 levels has resulted in an action plan for green shipping (Norwegian Government, 2019).

## 3.2 The financial sector and the growing importance of ESG

The financial sector represents the second instrumental driver for the decarbonization of shipping. Decarbonizing shipping will require a tremendous amount of money. One estimate[21] puts a price ticket of USD 3.4 trillion on the associated capital expenditure (i.e. not including fuel costs) for eliminating global carbon emissions from the sector. Studies have indicated that the additional cost on a per unit of transportation work basis may not necessarily be too significant relative to the value of the cargo being transported (see Appendix C). In other words, banks and investors are crucial for facilitating the transition, and are also in position to dictate the direction and speed of it. By virtue of banks' ability to define terms and criteria for financing, and investors' right to choose where to invest their money, these players can stimulate decarbonization by channeling capital to 'green' companies and projects.

#### Access to capital

Fueled by the increasing focus on and awareness of climate change and climate risks, the financial sector's demand for specific and comparable ESG information has grown rapidly the past years. Starting as information only requested by investors managing thematic funds (e.g., ethic or environment focus), it has now become a central part of company analysis related to investments, as investors acknowledge the risks associated to poor sustainability governance. In fact,

[20] See ISWG-GHG 9/WP.1/Rev.1 (Draft report of the ninth meeting of the Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG 9)).

[21] https://shipandbunker.com/news/world/237209-economist-martin-stopford-estimates-34-trillion-bill-for-shipping-decarbonisation. Accessed 24 June 2021.

companies with poor ESG efforts and governance are increasingly risking reduced access to capital as more and more investors channel capital away from assets and projects exposed to climate risk. Norges Bank Investment Management's (NBIM) document "Climate Change, Expectations of Companies" is an explicit example of evolving expectations in the financial sector[22]. The document outlines NBIM's expectations to its investee companies, related to how companies integrate climate-change considerations into strategy and risk management, in addition to information disclosure (reporting) and transparency.

In addition to capital markets' growing preference for sustainable companies, financing directly tied to sustainability performance has become widespread. Issuance of green bonds (see fact box) in the Nordic high-yield market accounted for 14% of the total volume in 2020, growing to 21% in the first four months of 2021 (DNB, 2021). Several shipowners, including Odfjell[23], Bonheur[24], and Fred. Olsen[25] have in recent years issued green or sustainability-linked (general corporate purpose, not "use of proceeds") bonds, or have borrowed money under green or sustainability-linked terms.

**Green bonds**
Green bonds were created to fund projects that have positive environmental and/or climate benefits. Most of the green bonds issued are green "use of proceeds" or asset-linked bonds. Proceeds from these bonds are earmarked for green projects but are backed by the issuer's entire balance sheet.

The Poseidon Principles[26], established by 13 leading banks engaged in the shipping industry are another example of the growing importance of the financial sector as a driver for transition. The principles establish a framework for assessing and disclosing the climate alignment of ship finance portfolios, set a benchmark for what it means to be a responsible bank in the maritime sector, and provide actionable guidance on how to achieve this.

## Regulations and legal requirements for ESG reporting

In addition to the market power of the financial sector, regulations and legal requirements related to corporate reporting are increasingly pushing companies to report on their ESG performance. On a national level, The Norwegian Accounting Act §3.3.c require that large corporations – meaning primarily public limited companies (ASAs) and listed companies – to report on their practices and efforts with respect to human and social rights, equality, environment, and corruption.

Looking beyond Norway, the European Union (EU) is introducing a variety of measures and regulations in the context of sustainable finance, with the EU Taxonomy[27] as the central element. The Taxonomy is a classification system intended to direct investments to sustainable projects and activities by establishing a list of environmentally sustainable economic activities – effectively providing a definition of what is "green". From 2022, all corporations covered by EU Non-Financial Reporting Disclosure (NFRD)[28] are required to disclose how, and to what extent, their business activities are aligned with the Taxonomy. The Taxonomy will initially cover only large corporations in the EU. However, the European Commission will encourage smaller businesses to voluntarily disclose their alignment with the Taxonomy, as these companies also play an integral role in value chains. It is also expected that investors and other companies in the value chain will expect this information to be disclosed. The Taxonomy Regulation has relevance for the European Economic Area (EEA), meaning that it will eventually be included as part of the EEA Agreement.

[22] https://www.nbim.no/contentassets/acfd826a614145e296ed43d0a31fdcc0/climate-change_web_2021.pdf
[23] https://www.odfjell.com/about/our-stories/odfjell-se-successfully-places-shippings-first-sustainability-linked-bond/
[24] https://news.cision.com/bonheur-asa/r/successful-placement-of-senior-unsecured-green-bonds,c3377216
[25] https://www.offshorewind.biz/2020/06/24/fred-olsen-enters-green-loans-for-jack-up-trio/
[26] https://www.poseidonprinciples.org/#about
[27] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en
[28] Listed companies and companies with > 500 employees within the EU.

### 3.2.2 Expectations from cargo owners

**The Sea Cargo Charter**
Bearing many similarities to the Poseidon Principles initiative by shipping banks, the Sea Cargo Charter was launched in 2020 and is a framework for aligning chartering activities with the IMO's ambition to reduced shipping GHG emissions by at least 50% by 2050 compared with in 2008.

The third instrumental driver for the decarbonization of shipping is the cargo owner, or charterer. Cargo owners are usually the ones paying for the maritime transportation service. As such, they have significant leverage and are themselves subject to expectations throughout their own supply chains from their customers and, ultimately, the end-consumers of what is being transported. Because of this, several large cargo owners have announced ambitious decarbonization targets, in some cases aiming for carbon-neutrality by 2030 and 2040[29]. With the IMO CII rating mechanism entering into force in 2023, each ship will have an annual rating A to E, which could become an important criterion for cargo owners selecting ships to charter. A group of major bulk-cargo owners have committed to increased transparency and a carbon intensity trajectory for their chartering activity through the Sea Cargo Charter scheme (see text box). Major cargo owners such as Amazon, Unilever, and IKEA have set a goal to purchase only those ocean freight services that are using scalable zero-carbon fuels by 2040[30]. In addition to committing to targets and trajectories, some cargo owners have also proved that their efforts can result in concrete zero-emission newbuild projects. In 2020, cargo owners HeidelbergCement and Felleskjøpet Agri invited tenders for a zero-emission bulk carrier (5,500 dwt) backed by a 15-year charter contract. With complementary cargo flows (Felleskjøpet transports grain one way, HeidelbergCement transports aggregates in the other direction), the two managed to develop a sensible business case, and in March 2021 it was announced that the Norwegian shipowner Egil Ulvans Rederi won the contract and will realize a hydrogen-fuelled bulk carrier within 2023/2024[31].

We anticipate cargo owners' impact on shipping decarbonization to strengthen in the future as reporting requirements are expected to evolve to include all relevant GHG emissions from the supply chain. This means that cargo owners will need to report on the emissions from their shipping activities – for example, Scope 2 emissions from transport of fuel, and Scope 3 emissions from transport of their goods[32].

[29] See, for example, the positions of Fortescue at https://www.fmgl.com.au/workingresponsibly/climate-change-and-energy, and Anglo-American at https://www.angloamerican.com/sustainability/environment/climate-change

[30] https://www.reuters.com/business/sustainable-business/amazon-others-commit-using-zero-carbon-shipping-fuels-by-2040-2021-10-19/?s=09

[31] https://www.tu.no/artikler/norsk-rederi-bygger-verdens-forste-hydrogendrevne-lasteskip/508390?key=GkINzNPU (in Norwegian)

[32] The GHG Protocol breaks down GHG emissions into three categories: Scope 1 are defined as those caused directly by an organization's activities; Scope 2 emissions count indirect emissions resulting from an organization's energy consumption; Scope 3 is defined as all other indirect emissions caused along an organization's value chain. Read more at https://ghgprotocol.org/

# COURSE TO ZERO

maritime BERGEN
THE INDUSTRIAL SHIPPING CAPITAL

AGENDA VESTLANDET

Vestland fylkeskommune