GREEN SHIPPING FINANCE

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ZEETUG
Zero Emission Electric Tug Boat

Designer & Builder
NAVTEK
NAVTEK NAVAL TECHNOLOGIES INC.

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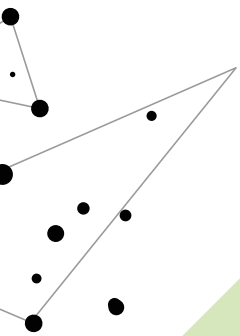

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Member of Waterborne Technology Platform https://www.waterborne.eu/

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IN MEMORIAM OF FATİH DÖNMEZ

We have lost Fatih Dönmez during Covid 19 pandemic. His mother lost her only son; his sister lost her dear brother, and we bid farewell to our dear colleague, our comrade.

He was 47 years old; Fatih vanished at the prime of his life, taking with him his sharp mind and 25 years of human and business experience.

Was it only his loved ones that lost Fatih? No, this is also an invaluable loss for our country.

We will miss a dedicated Naval Architect and Marine Engineer who gained immense experience during his uninterrupted work for 25 years, which is why he could not find the time to complete his post graduate degree.

Fatih was the leader of the design team for more than 100 merchant ships now proudly cruising on the seas all around the world;

Designed the world's first underwater archaeological research vessel,

Designed the world's first self-propelled floating power plants,

Led the design team of the LST class tank landing ships, TCG Sancaktar and TCG Bayraktar, which are the source of pride of Turkey's naval fleet,

He also brought a unique design capacity for the LCM landing crafts, TCG Anadolu among them, is a candidate to become the flagship of Turkey's naval fleet,

Designed the concept of more than ten sophisticated surface platforms for various naval forces in the world,

Designed the world's first rechargeable, fully electric harbour tugboat,

He touched the lives of more than 50 young engineers, mentored them and helped paved the way to success in their careers.

We have lost a humble, matchless executive engineer who only focused on his work.

His untimely death has driven us into a deep sorrow. Our loss is grievous indeed and now, we feel incomplete without him.

May He Rest in Peace.

With the latest developments in maritime sector for the last twenty years, Turkey has become one of the countries having the capacity to design and build sophisticated and high-tech ships across the World.

Our shipyards, naval design and engineering firms have played a significant role in this well-deserved success and there is no doubt that Turkish Shipbuilding Industry sector will sure produce ground-breaking projects in the international arena and write even greater success stories.

Today, in the world agenda, the most important item standing out is innovative projects that are sensitive to environmental issues such as reducing the usage of fossil fuels and carbon emissions.

In this regard, NAVTEK (Marine Technology Inc.) has become the leading firm that designed, built and delivered the world's first battery powered, rechargeable, emission-free (zero-emission) tugboat.

Within the scope of the Project, a guidebook has been prepared to help investors, tugboat and maritime organizations who aspire to make their ventures more environmentally friendly.

This guidance informs about and explains how EU and other countries look at "Green Shipping" concept and the incentives that can be used in building ships sensitive to the environment as well as tax-reduction and the like in the years to come. It also widens investors' horizon by evaluating the public and private banking institutions that provides financial support to eco-friendly maritime projects.

I would like to congratulate NAVTEK not only on building and developing zero-emission port tugboat but also on sharing this detailed, up-to-date research with those of you who desire to invest in a clean and environmentally friendly future.

The path taken in the last 20 years, Turkey's maritime sector especially in shipbuilding is now taking place among the countries which can provide sophisticated ship design and construction of a world scale. Our design and engineering companies and shipyards have an important role in this success.

The Turkish Shipbuilding Sector, which produces projects that makes a sound in the international arena, will achieve even more success.

In today's world agenda there are important innovative projects that are more eco-friendly: striving to reduce the use of fossil fuels and reduce the emissions it emits to the environment. In this context, NAVTEK Naval Technologies Inc. has developed, designed, built and delivered the world's first fully battery-powered, rechargeable and emission-free (zero-emission) harbor tugboat. Our company has achieved the success of being a leading technology company in this field.

Within the scope of the project, this guidebook has been prepared for all tugboat and maritime operators to help investors who try to make their new investments more eco-friendly and climate resistant.

This booklet examines the perspectives of the European Union and several countries on the view of Green Maritime finance, incentives, loans and similar supports that can be used in environmentally sensitive shipbuilding investments in the coming years.

It also broadens the perspective of investors by evaluating state and private banking and credit foundation institutions that will provide financial support to eco-friendly maritime projects.

I would like to congratulate NAVTEK to not only developing such an eco-friendly Zero Emission All Electric Project, but also for sharing up-to-date information on financing and state support details for those who want to invest on eco-friendly Technologies as well as on a clean and healthy planet.

Murat KIRAN

President of Turkish

Shipbuilders' Association

(GİSBİR)

Three years ago, it was just a futuristic idea or no more than a dream; to build a rechargeable, zero-emission, fully electric harbour tugboat. Yet, our dream come true!

Today, we are celebrating the first emission free and fully electric tugboat, ZEETUG (Zero Emission Electric Tugboat), has been launched successfully and giving service for more than a year, emission-free and noise-free.

I believe, today the power systems of sea vessels have changed forever, the future of shipbuilding industry is now evolving around battery and hydrogen fuel cell powered ships.

We, as NAVTEK, have developed, designed, and built the world's first zero emission, fully battery powered harbour tug – ZEETUG and we have already received a great demand for these tugboats both from abroad and at home. We have reached the era of zero emission game-changing technologies that will shape the future of maritime industry.

This state-of-art new technology may puzzle the investors' mind; differences on CAPEX, OPEX and different operational approaches and requirements. This booklet has been prepared to assist in-vestors who have chosen to be pioneers of future green maritime technology on available green shipping financing: subsidies, funding opportunities and modalities including EU and other countries' policy perspectives. We are confident that "Green Shipping Finance" booklet will be helpful to po-tential maritime investors for their future greener investment.

"Protecting our planet and future of the next generations" are our core vision and common goal that shape our businesses and lives while keeping in mind that there is no other planet to go to.

Ferhat Acuner

NAVTEK

Director General

HOW TO GET FINANCE for GREEN SHIPPING?

HOW TO GET FINANCE for GREEN SHIPPING?

This guidance document prepared for Navtek Naval Technologies Inc. aiming to provide support to potential clients who wants to invest in greener future in maritime sector. This guide will provide overall major developments in the Green Shipping industry and especially looking into green shipping finance, state supports and subsi-dies and investment modalities that will shape the green sipping industry in coming years.

1 INTRODUCTION

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Introduction

The global shipping industry is making waves as it quickly approaches the turning point of a new decade with its commitment to tackling climate change.

Green shipping is when people or goods are transported through ships using minimum resources and energy as possible, to protect the environment from the pollutants generated by the ships. Green shipping promotes cleaner practices to enforce emission control, efficient port management, and equipment management. It requires a huge effort from every element of the industry such as the regulators, port authorities and communities to carry this forward.

Shipping has become an essential part of the world supply chain and with the effects of climate change becoming more visible, the contribution of CO_2 and GHG (Greenhouse Gases) from the transportation industry is going up. According to the European Commission, the shipping industry releases 940 million tonnes of CO_2 and makes 2.5% of the GHG emissions. Ships currently use heavy fuel oil which is a filtrate from crude oil distillation. Crude oil has sulphur and is emitted by the ships during transportation. Not only is this harmful to human health and contributes to respiratory and human diseases, but SOx also causes acid raid, which is extremely harmful to crops, ocean species and acidifies the oceans.

Hence, the International Maritime Organisation (IMO) has taken a strong stance against these sulphur emissions and has introduced the mandate IMO Sulphur 2020. Under this mandate, all ships must switch to an alternative fuel oil that emits less than 0.50% sulphur into the environment from the 1st of January 2020. This can lead to a 77% drop in the emission of SOx from the ships and thereby reducing air pollution. It is a notable fact that if the sulphur emissions are not reduced, it can cause more than a million premature deaths between 2020-2025.

Green shipping is a challenging task for the shipping industry, even when it is the cleanest and safest mode of cargo transport. An average cargo ship with 8000 deadweight tonnage emits 15g of CO_2 which is much more efficient than Truck (50g) and air (540g), but this can increase by 50% to 250% with the increasing trade volume. In the last decade, efforts have been taken to enforce sustainable practices and green shipping initiatives. Just recently, the United Kingdom has committed to 1 million pounds for R&D to reduce emission in the maritime industry and has become the first country to pledge zero emissions by 2050.

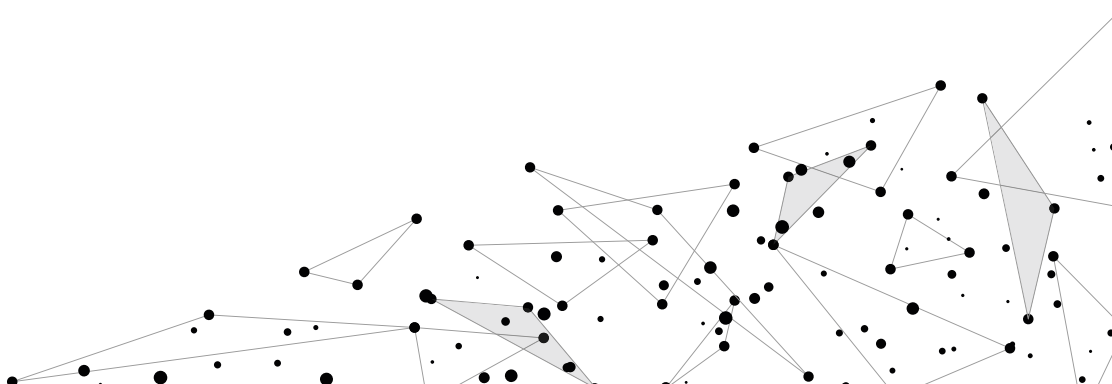
Source: https://container-xchange.com/blog/5-green-shipping-initiatives-reduce-ghg/

Why are ships becoming electric?

Ships transport about 80 percent of the world's commodities, reported the United Nations Conference on Trade and Development. And transportation across the oceans will continue to rise in the coming years – by 3.8 percent per annum by 2022. However, ships produce a huge amount of exhaust gases, such as sulphur oxides, nitrogen oxides, soot particles and fine dust, and also CO_2. Market researchers at IDTechEx One have calculated that one single large ship emits as much CO_2 as 70,000 cars, as much nitrogen oxide as 2 million cars, and as much fine dust and carcinogenic particles as 2.5 million cars. Consequently, ships produce 15 percent of global nitrogen oxide emissions. Because of this, ships are among the most serious sources of pollution in seaports.

Most container and cruise ships, oil tankers, and cargo vessels run on heavy diesel oil. And they consume enormous amounts: Together, the 90,000 ships worldwide burn 370 million tons of fuel each year – and produce 20 million tons of sulphur oxide. In inland shipping, on the other hand, marine diesel is used as a fuel, which is less harmful than heavy oil when it is combusted. In addition, fewer dangerous nitrogen oxides are emitted. The exhaust gases have disastrous consequences for the environment: The world's climate is changing; the oceans are acidifying. There are health risks – from asthma in children to premature death.

https://www.infineon.com/cms/en/discoveries/electrified-ships/



Worldwide Demand for environmentally friendly Ships

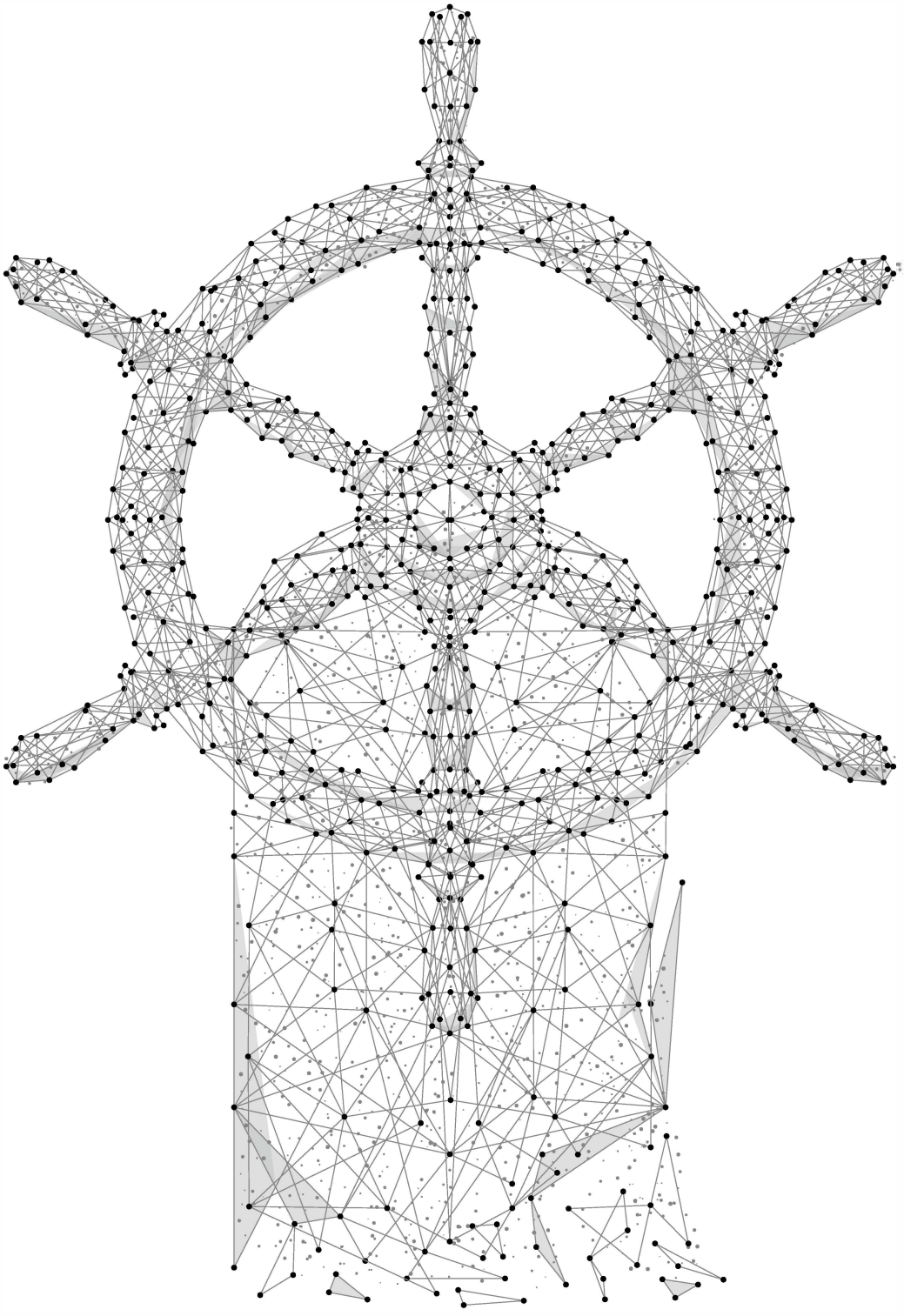
Because of the world economic downturn since 2008, worldwide cargo and trade volumes have decreased. The supply-demand imbalance in the shipping market following the decline in cargo volume has led to a decline in long-term freight rates. However, despite the lo ng-term supply-demand imbalance, newbuilding orders have increased. In particular, large-scale ship orders have benefited from economies of scale in the wake of the shipping downturn, although special purpose ship orders have added to oversupply. In this context, the substitution of environmentally friendly, high efficiency vessels for older ships is the main cause of oversupply.

Aside from the recession in the shipping market, related global environmental regulations are strengthening. These regulations include the toughening of the sulphur content standards for bunker oil and the control of the Emission Control Area (ECA), the English Channel, the North Sea, and the Baltic Sea. Thus, despite the recession, shipping companies need to take measures to meet international environmental regulations (Kim, 2015a, Kim, 2015b).

First, the environmental regulations of the International Maritime Organization (IMO) are gradually expanding. According to the IMO Conventions, ships are to be constructed with an immediate reduction in greenhouse gas (GHG) emissions of 15%, then 20% by 2020, and 30% by 2025. In addition, the IMO approved internal guidelines for GHG regulation at the 59th General Assembly of the Marine Environment Protection Committee (MEPC) in 2009 and revised Marine Pollution (MARPOL) Annex VI in order to reduce carbon dioxide (CO2) emissions from ships by 2030 at MEPC's 62nd General Meeting in July 2012 (Kim, 2015a, Kim, 2015b).

Currently, eco-friendly vessels are green vessels that meet the IMO Conventions, which came into force in accordance with regulations published by the IMO. Despite the fact that commercialization is yet limited, the introduction of eco-friendly vessels is necessary in order to meet the environmental regulations of international ports and ports in developed countries as well as to handle the replacement of bunker oil, which involves high uncertainty and represents the largest portion of operating costs in the shipping industry (Yang, 2012).

Eco-friendly vessels are recognized as a new competitive advantage because of environmental regulations, fines, and incentives. Thus, many shipping companies are preparing eco-friendly ships that offer such an advantage. As a result, despite the IMO's MARPOL 73/78 annex, the importance of eco-friendly vessels to shipping companies lies in their role as strategic vessels that can avoid environmental fines, regulations, various other fines, and taxes as well as their energy-efficient capability. The shipbuilding and shipping industry is taking the lead in building eco-friendly vessels that reduce fuel consumption, thereby maximizing fuel efficiency by replacing existing ships that have difficulty competing in terms of cost and that cannot meet environmental standards.



2 GLOBAL CLIMATE CHANGE AND IT'S IMPACTS

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2 GLOBAL CLIMATE CHANGE AND IT'S IMPACTS

The Paris Agreement on climate change was agreed in 2015 by Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and entered into force in 2016. The Paris Agreement central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The Paris Agreement does not include international shipping, but IMO, as the regulatory body for the industry, is committed to reducing greenhouse gas emissions from international shipping.

IMO INTERNATIONAL MARITIME ORGANIZATION

In 2011, IMO became the first international body to adopt mandatory energy-efficiency measures for an entire industry sector with a suite of technical and operational requirements for new and existing vessels that entered into force in 2013. By 2025 new ships built will be 30% more energy efficient than those built in 2014.

Subject to amendment depending on reviews to be conducted by the Organization, the Initial Strategy identifies levels of ambition for the international shipping sector noting that technological innovation and the global introduction of alternative fuels and/or energy sources for international

shipping will be integral to achieve the overall ambition. The reviews should take into account updated emission estimates, emissions reduction options for international shipping, and the reports of the Intergovernmental Panel on Climate Change (IPCC), as relevant.

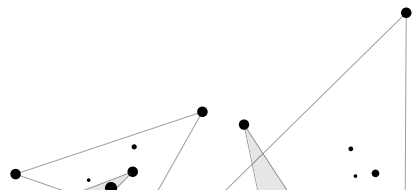
Levels of ambition directing the Initial Strategy are as follows:

- carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate;

- carbon intensity of international shipping to decline to reduce CO_2 emissions per transport work, as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008; and

- GHG emissions from international shipping to peak and decline to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO_2 emissions reduction consistent with the Paris Agreement temperature goals.

Source:https://unfccc.int/sites/default/files/resource/250_IMO%20submission_Talanoa%20Dialogue_April%202018.pdf



3 CHALLENGES FOR MARITIME TRANSPORT SECTOR AND DECARBONISATION

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CHALLENGES FOR MARITIME TRANSPORT SECTOR AND DECARBONISATION

As provided in IMO's climate strategy, carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate in line with the Paris Agreement temperature goal. This highly technological challenge was achieved very recently by a handful design and engineering companies such as Navtek Naval Engineering Inc. by a state of art innovative technologies.

Despite these early promising technological developments, the shipping sector is struggling to decide which future fuels offer the most cost-effective way to cut carbon emissions.

Shipping companies face great uncertainty over how to decarbonise the sector, delegates at the International Chamber of Shipping conference in London heard in 18th September 2019.

Carbon emissions from shipping are currently around 0.9 gigatons (Gt) of CO_2 and account for almost 3% of global emissions—the equivalent of Germany. Growing demand for shipping could see its emissions increase to 1.7 Gt by 2050 under a business-as-usual scenario. Most emissions (87%) come from international freight shipping.

Challenges for Green Shipping

"Shipowners won't do it because they're unwilling to put their capital at risk and they don't want to be first movers – so they point me to the cargo owners saying it's their responsibility."

The cargo owners say, "Shipping is not our business; we'll buy green shipping, create the demand, but it's not for us to invest in innovation in another industry."

We talk to ship financiers who say that because they can't subjugate their senior debt, they are only able to fund 'proven' technology.

We talk to private equity and venture capitalists who say that shipping finance is a bit of 'dark art' and they aren't prepared to go there.

The market is so fragmented, disjointed and broken that no one entity or individual is empowered to take the risk

National governments haven't been able to support maritime projects because shipping is 'an international problem' and they think, "If it's so good why doesn't industry support it?", and they want to see in-sector support.

Di Gilpin from the Smart Green Shipping Alliance

https://splash247.com/decarbonisation-whose-risk-is-it/

Adair Turner, chair of the Energy Transitions Commission, said he was **"absolutely confident"** that it was technically and economically feasible to achieve a net-zero carbon economy by 2050.

Lord Turner presented the findings of research on achieving net zero in sectors that have significant technological and economic barriers to decarbonisation such as shipping, aviation, steel and cement.

Operational efficiency measures such as optimising ship speed and route could cut CO_2 emissions by 5%. Energy efficiency improvements in ship design and wind assistance technology could deliver reductions of 30-55%. But fully decarbonising shipping requires ship owners to move away from conventional heavy fuel oil to alternative fuels and engines.

In the long run, ammonia used in internal combustion engines or fuel cells is likely to be the most cost-effective zero-carbon fuel, especially for long-haul freight transport. For shorter journeys, electric motors combined with batteries or hydrogen fuel cells are the most promising option.

The commission calculates the cost of these options at US$150-300 per tonne of CO_2 saved, mak-ing shipping one of the most expensive sectors to decarbonise, increasing freight costs by 110%. However, because transport costs are a very small part of the final retail price of products, the cost of decarbonisation to consumers would be negligible.

Future Fuels

Some ship owners are buying new vessels with liquified natural gas (LNG) engines, primarily to achieve the IMO's 0.5% limit on sulphur emissions that comes into force on January 1st 2020. LNG can reduce ship CO_2 emissions by 9-12%, according to the Energy Transitions Commission, and compares favourably on cost with heavy fuel oil. Tom Strang, maritime affairs senior vice-president at Carnival Corporation, said the company has 21 new cruise ships on order, of which ten are powered by LNG.

By contrast, some attendees argued that LNG could only be a transition fuel given its modest carbon saving. There is a danger that investing in LNG infrastructure at ports could make it harder to switch to zero-carbon fuels unless it could be adapted for other alternative fuels. There is also concern over methane leakage from LNG facilities, which has a global warming potential some 30 times higher than CO_2

Biofuels can be used in existing engines and could cut ship emissions by 60-70%. However, much depends on the sustainability of the biomass from which it is produced, and it would still produce local air pollution. Its cost would also be high—similar to ammonia, according to the Energy Transitions Commission. Shipping companies may also find themselves competing for biofuel supplies with aviation, a sector that may be willing to pay more, as it has far fewer alternative fuel options.

The conference heard frequent calls for collaboration, not just within the shipping sector but along the value chain, including ports and fuel producers, to develop and scale up alternative fuels. Lessons need to be learnt from the 2020 sulphur limit, which, despite being adopted in 2008, some shipping companies are struggling to meet due to their failure to act in time.

Conference attendees highlighted several barriers to decarbonisation. Chief among these is that ammonia and hydrogen are not widely available as ship fuels. This would require refineries and ports to create fuelling infrastructure around the world. And to be genuinely zero carbon, the fuels would need to be manufactured using renewable energy. There are also concerns about the safety of ammonia and the additional space requirements of hydrogen that could reduce cargo capacity.

Overall, there was a view that the IMO has placed responsibility for meeting the carbon target on ship owners, while in reality the shipping sector is fragmented between ship owners, ship operators and charter companies, reducing the ability and incentive to invest in new technologies.

Financing decarbonisation

Banks are stepping up action to finance ship decarbonisation through the Poseidon Principles launched in June 2019 by 11 banks.

The principles are an assessment and disclosure framework that enables banks to "align their ship finance portfolios with responsible environmental behaviour and incentivise international shipping's decarbonisation." They also provide a tool for banks to meet the recommendations of the Task Force on Climate-related Financial Disclosures by reducing the financial risk of climate change and supporting a low-carbon economy.

The principles require signatory banks to obtain carbon data from ship owners through a standardised covenant clause in loan agreements. Michael Parker, chairman of global shipping at Citigroup, said the principles were designed to facilitate decarbonisation by supporting the IMO target. The principles do not specify other loan conditions, such as requirements to achieve energy efficiency or emissions targets, although banks are able to add these if they wish. The Poseidon Principles Association will publish a progress report later this year.

The conference concluded that the shipping sector was entering a period of uncertainty over the best way to decarbonise. Baroness Worthington said there is no "silver bullet" in the form of a single zero-carbon fuel that could replace heavy fuel oil in all applications. Instead, there is a diverse range of "silver buckshot" solutions suitable for different segments of the market that together could take the sector towards zero carbon by 2050.

https://www.woi.economist.com/shipping-faces-uncertain-route-to-zero-carbon-future/

In addition, the ports need a suitable charging infrastructure. This is already an issue with shore-side electricity, since cruise ships need electricity continuously for their hotel operations when docked. Often, they generate this with motors and auxiliary power units – and emit pollutants. It would be much more environmentally friendly to purchase the electricity directly in the port. However, shore-side electricity facilities such as this are still rare. The ports would therefore have to invest a lot of money for charging equipment. The batteries are also still too expensive for many shipping companies., a development centre for maritime technology and transportation systems in Germany, batteries are the most expensive component on an electric ship.

Nevertheless, electric drive systems are still possible for ferries and inland vessels. They dock frequently and can either exchange batteries in containers or briefly recharge the batteries every time they dock and charge them completely overnight. Source: https://www.infineon.com/cms/en/discoveries/electrified-ships/

Many shipowners have demonstrated a willingness to improve their environmental performance. For example, Cargill has pledged to cut greenhouse gas emissions by 15 percent per cargo-tonne-mile by 2020, in line with the group's intention to reduce overall emissions by 10 percent by 2025.

Despite their apparent commitment to environmental improvement, owners face a number of challenges to making this reality.

Firstly, competitiveness: Investing in greener technologies represents an upfront expense that does not provide owners with a competitive advantage. Users of shipping services are not always willing to pay for goods to be transported in a more environmentally friendly manner, although stricter emissions standards will ensure a more level playing field in this respect.

Secondly, the availability of financing: For various reasons, many commercial banks have reduced their lending to the shipping industry. Some banks decided to withdraw from the sector following the 2008 financial crisis. In addition, commercial banks have limited capital and tough choices to make. Ship financing is not always an easy sector to be in, given its high levels of capital utilization, cyclicality and associated risk.

Source: https://www.assetfinanceinbrief.com/2018/10/financing-green-shipping/

Are electric ships viable?

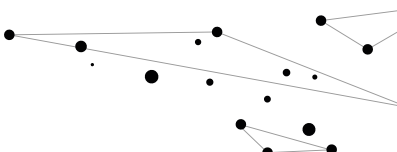
It is no secret that the world is looking for new, more efficient sources of energy, creating a new energy era. Stricter regulations combined with lighter and more powerful batteries, play an important in making electric propulsion an attractive choice, Lucy Gilliam, an expert on aviation and shipping at the nongovernmental organization Transport and Environment, explained.

One of the arguments why batteries can't be used is that ships don't have enough capacity. This is not necessarily true, Lucy Gilliam said, explaining that, especially on short journeys, batteries don't add more weight in comparison to traditional fuel powered ships.

Speaking at SAFETY4SEA, Jan Kjetil Paulsen, Senior Advisor Shipping at the Bellona Foundation, seemed optimistic about the future of electric ships as well.

Electrification of shipping will in most cases represent a profitable business case: energy from renewable electricity can in most European countries compete with energy from fossil sources: Electric motors are less complicated than combustion engines, which again will increase lifetime and reduce service and maintenance cost for the equipment. The initial investments (CAPEX) in new technology might be a challenge, as well as investments in the required infrastructure for shore connection and charging infrastructure. The latter must be seen as a public responsibility financed by the government and managed by the local harbour / waterways administrations.

Source: https://safety4sea.com/cm-electric-vessels-are-making-waves/



4 INTERNATIONAL INITIATIVES

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4 INTERNATIONAL INITIATIVES

4.1. MARPOL

MARPOL (The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78), is short for International Convention for the Prevention of Pollution from Ships and 73/78 short for the years 1973 and 1978) is one of the most important international marine environmental conventions. It was developed by the International Maritime Organization with an objective to minimize pollution of the oceans and seas, including dumping, oil and air pollution.

As of 1 January 2020, new emission standards are enforced for fuel oil used by ships, in a regulation known as IMO 2020. The global sulphur limit (outside SECA's) dropped from allowed 3.5% sulphur in marine fuels to 0.5%. This will significantly improve the air quality in many populated coastal and port areas, which will prevent over 100,000 early deaths each year, and many more cases of asthma in these regions and cities. Over 170 countries have signed on to the changes, including the United States.[12] This is expected to create massive changes for the shipping and oil industries, with major updates required to ships and the increased production of lower sulphur fuel.

The IMO has worked on ensuring consistent implementation of the 0.5% sulphur limit in its Marine Environmental Protection Committee (MEPC) and its subcommittee on Pollution Prevention and Response (PPR). This has led to the development on several regulatory and practical measures (FONAR's, Carriage Ban, Ship Implementation Plan etc.) to enable any non-compliance to be detected, for example during port State controls (PSC's). https://en.wikipedia.org/wiki/MARPOL_73/78)

4.2. De-carbonisation Policies in the EU

Investment Plan for Europe

In October 2009, the European Commission proposed that GHG emissions in the shipping industry should be reduced by 20% by 2020 compared with the 2005 levels. In recent years, the EU has been actively participating in GHG measures that include the introduction of carbon taxes for consumers and businesses that use polluting products and technologies.

https://www.greenaward.org/sea-shipping/certificate-holders-ships/list-of-incentive-providers/

The Investment Plan for Europe, known as the "Juncker Plan", is one of the European Commission's top priorities. It focuses on boosting investment to generate jobs and growth by making smarter use of new and existing financial resources, removing obstacles to investment, and providing visibility and technical assistance to investment projects.

The European Fund for Strategic Investments (EFSI) is the main pillar of the Juncker Plan and provides first loss guarantees, enabling the EIB to invest in more projects that often come with greater risks. EFSI has already yielded tangible results. The projects and agreements approved for financing under EFSI are expected to mobilise almost EUR 380 billion in investments, including 10 billion in the Netherlands, and support 842 000 SMEs in the 28 Member States.

The Green Shipping Guarantee Programme (GSGP) is a sector risk bearing facility supported by the Connecting Europe Facility (CEF) and the European Fund for Strategic Investments (EFSI), designed for projects that will improve the environmental performance of transport vessels in terms of reducing the emission of pollutants as well as increasing fuel efficiency. Projects should be proposed to the EIB's intermediary partners and will be subject to their financial and non-financial risk acceptance criteria.

https://ec.europa.eu/commission/news/investment-plan-europe-ing-and-eib-provide-eu110m-splieethoffs-green-shipping-investments-2019-feb-28_en

The EU's green shipping policies

Can be divided into policies that directly reduce emissions from ships and modal shift policies that indirectly reduce emissions. A typical policy of the former category is a marine pollution control strategy; a typical policy of the latter is a Marco Polo program. The EU's direct regulations are in overall harmony with those of the IMO; however, the EU has a stronger response than the IMO regarding shipbuilding GHG reductions and the introduction of double-hull oil tankers.

First, the EU's policies that directly reduce emissions from ships are enforcing sulphur dioxide emission regulations and encouraging the use of land power equipment. In this regard, the EU has decided to enforce regulations about the sulphur content in fuel oil used in ships through EU Directive/2005/33/EC. This regulation has been applied since January 1, 2010. In accordance with the

regulation, fuel oil exchange procedures and equipment operation manuals should be provided on a vessel. Further, the use of fuel oil with a sulphur content of less than 0.1% m/m and the training of crew members regarding fuel oil change times and the application of EU fuel oil regulations should be recorded in the logbook. The equipment to be regulated for fuel oil use is all a vessel's engines and boilers that operate while at its berth.

On May 8, 2006, Commission Recommendation 2006/339/EC was implemented. The Commission stressed that current trends may have a greater impact on polluting emissions than maritime transport by 2020. It also recommended that member states should install land-based power equipment for use by vessels at ports and give economic incentives to operators that use these power facilities. In addition, member states were asked to work on the international standardization of ports' land power equipment in accordance with IMO guidance.

Second, since 1975, European modal transport policies have encouraged modal shifts from road transport to rail, inland water, and coastal transport. At the time, it was predicted that the current situation would lead to a rapid increase in the proportion of road transport in Europe. In order to overcome this crisis, the Pilot Action for Combined Transport (PACT) was introduced. The EU, which failed to deliver the expected results from PACT, then introduced a new modal shift policy, the Marco Polo program, based on the lessons learned. The Marco Polo program was designed to be systematic and future-oriented compared with the PACT program. The European Parliament introduced Commission Regulation 1382/2003 (Regulation (EC) No. 1382/2003 on July 22, 2003 and endorsed financial support for the Marco Polo program in order to improve the environmental efficiency of the freight transport system.

The Marco Polo I program, like the PACT program, aimed to support commercial services in the logistics market. However, unlike the PACT program, Marco Polo I set a quantifiable and verifiable goal for modal shift. In other words, the goal was to keep the ratio of vehicles in 2010 at the 1998 level. This program focused on the commercial logistics services market and not research, development, or infrastructure building. The ultimate goal was to help move cargo transport, which amounted to approximately 12 billion t-km per year, from the road to coastal shipping, rail, and inland waterways.

The Marco Polo II program has a purpose similar to Marco Polo I. In other words, its purpose is to contribute to an efficient and sustainable transportation system by reducing traffic congestion and increasing the environmental efficiency of complex transportation systems. The Marco Polo II program has two additional funded projects, the Maritime Expressway and Congestion Avoidance.

What is the Marco Polo II programme?

Maritime transport was a key feature of Marco Polo, the European Union's funding programme for projects which shift freight from the road to sea, rail and inland waterways. This means fewer trucks on the road and thus less congestion, less pollution, and more reliable and efficient transport of goods.

Marco Polo continued from 2007 to 2013 and has an annual budget of around €60 million.

Examples of the projects funded under the Marco Polo Programme;

Green Award Foundation

The Netherlands is implementing a policy to reduce CO_2 emissions by 30% by 2020 compared with the 1990 level. The Netherlands intends to reduce its CO_2 emissions by more than the requirement of the European Union (EU). The reduction target for the EU is 20% lower than the 1990 levels by 2020.

The goal of the Rotterdam Climate Initiative (RCI) is to reduce CO_2 emissions by 50% compared with 1990 levels by 2025 and promote 100% climate proofing by 2025. The target of 50% is 30% higher than the EU's 2020 target and 20% higher than that of the Netherlands. The Rotterdam En-ergy Port and Rotterdam Sustainable Mobility are directly related to the harbours that are among those subject to the 50% reduction targets for CO_2 emissions. The Rotterdam Energy Port states that more than 85% of Rotterdam's CO_2 emissions come from the industrial sector and that energy efficiency, energy produced with low CO_2 emissions, and energy-efficient product use are required. Rotterdam Sustainable Mobility recommends the use of clean fuel and alternative transportation.

In addition, the Green Award Foundation has been established to implement the Green Award system. This system gives benefits such as port cost discounts to certified shipowners.

What is a certificate holder?

Green Award certificate holder is a top-notch ship management company with at least one ship that can meet the Green Award requirements.

Green Award certificate holders are the front runners of the maritime industry that strive for ex-cellence.

Their outstanding quality and safety standards as well as enhanced environmental performance have been audited and confirmed with the Green Award certificate.

Green Award certified companies and vessels are entitled to various incentives to encourage their socially responsible behaviour.

Benefits for certificate holders

Green Award certificate holders benefit in many ways from their participation in the scheme.

Not only they receive recognition by the maritime industry and get expert assessments, but they are also entitled to various financial, operational and promotional advantages.

Ship management companies can join as Certificate Holders

Ships and shipping companies in a possession of the Green Award certificate will benefit from:

- Independent audit performed by experienced and skilled surveyors working exclusively for Green Award
- Results of surveys on board and onshore are strictly confidential, only you will be informed about points for improvement
- Potential prevention of PSC detention or serious incidents
- Tool to maintain and improve safety, quality and environmental standards
- Advice on Best Practices
- Competitive advantage– Green Award helps to differentiate your company from competitors
- Financial incentives– discounts on port dues and maritime-related services and products
- Higher ranking in the RightShip and recognition in the Equasis database
- Green & high-quality image to the industry, authorities and the public
- Publicity and Promotion: use of Green Award logo, listing on Green Award website and other promotional materials, invitation to Green Award annual events etc

  Link for list of Incentives please check:
  Source:https://www.greenaward.org/sea-shipping/certificate-holders-ships/list-of-incentive-providers/ https://www.sciencedirect.com/science/article/pii/S2092521217300652

Sustainable Shipping Initiative

SSI
Sustainable Shipping Initiative

The SSI is a four-stage initiative designed to help the industry make long-term plans for future success. Its members are leading companies from around the world and NGOs Forum for the Future and WWF. The cross-industry group represents ship owners and charterers, shipbuilders, engineers and service providers, banking, insurance, and classification societies.

Objectives: Bringing together leading companies in the maritime sector to create a sustainable and successful shipping industry by 2040.

Activities: Looking ahead the SSI strategy will focus on three activities:

1.Promoting individual leadership through nearer-term commitments and sharing individual action and performance widely. 2.Innovation platforms that seek to tackle existing barriers in partnership with others and also identify new areas that present risks and opportunities for the industry. 3.Be-

coming the progressive voice for the industry and scaling up the great solutions that already exist through media and communications activities

Participant Companies:

ABN AMRO (Netherlands), Bunge (USA),China Navigation Company (China),Forum for the Future (USA),IMC (Singapore),Louis Dreyfus Company - LDC (Netherlands),Lloyds Register (United Kingdom),Maersk (Denmark), Oldendorff (Germany), Pria Blue (India), Rightship Qi (China),South32 (Australia),Standard Chartered (United K.),WWF (USA).

Source: https://www.sustainableshipping.org/

The Regional ECOFeeder

The successful project is a result of input and willingness to share knowledge from all participating partners. The Regional ECOFeeder is a collaboration between:

- AAB
- Alfa Laval
- Bureau Veritas
- Corvus Energy
- Danfoss VLT Drivers
- Danish Maritime
- DNV GL
- DTU Mechanical Engineering
- HOK Marineconsult
- Lloyd's Register
- MAN Diesel & Turbo
- Odense Maritime Technology
- Rolls Royce Marine
- Silverstream Technologies
- VP Solutions

A collaborative process is dependent on facilitation and resources. The Regional ECOFeeder project was made possible by the financial contribution from the Danish Maritime Fund. The Danish Maritime Fund was founded in 2005 and the objective of the foundation is to support initiatives that develop the Danish maritime industry

Source:

https://greenship.org/wp-content/uploads/2017/04/Bilag-1-The-Regionalecofeeder.pdf

5 INTERNATIONAL INITIATIVES

GREEN SHIPPING FINANCE

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NEW CARBON TECHNOLOGIES IN MARITIME SECTOR

How emissions can be reduced?

In April 2018, the International Maritime Organization decided to drastically reduce emissions. By 2050, the 173 member states of the UN organization want to at least halve CO_2 emissions from ships compared to 2008. Since March 2018, fuel consumption of all ships, and consequently, exhaust emission, must be logged. Since 2020, only fuel containing no more than 0.5 percent sulphur may be used. Currently, the limit value is seven times that.

> But the recent publication of the 4th IMO GHG study underlined the importance of urgently reassessing that hierarchy of risk. The greatest risk to us all, both commercially and as citizens, comes from climate change. That new evidence shows emissions from shipping rising 10% from 2012 to 2018. Most alarming were the increases in short-lived climate super-pollutants – a 12% increase in black carbon and a 150% increase in methane emissions. Methane traps 86 times more heat in the atmosphere than the same amount of CO2 over a 20-year time period.
> https://splash247.com/decarbonisation-whose-risk-is-it/

If the ambitious plan is to succeed, a change of thinking will be required. But what options are available to reduce emissions? There are various possibilities: For example, ships could install catalytic converters, similar to cars. These separate harmful nitrogen oxides into nitrogen and oxygen and a soot filter retains particulate matter. Or the ships could use marine diesel instead of the extremely dirty heavy oil. Marine diesel contains much less sulphur but is much more expensive. Besides, both of these options have a significant disadvantage: They are based on an internal combustion engine and, consequently, fossil fuels. However, the mineral oil from which diesel is produced could be exhausted in 50 years at the current rate of consumption.

This is why the use of other energy sources is more efficient and cleaner, such as liquefied natural gas (LNG), hydrogen, or electric energy. Electrical drive systems are not just deemed to be sustainable on land and in the air. In many cases, the environmentally friendly alternatives to oil are suitable for inland shipping – and also for oceangoing ships in the distant future. One advantage of battery operation is that electricity is much cheaper than oil and, especially, marine diesel. Because of this, the analysts at IDTechEx predict that worldwide sales of fully electric and hybrid ships will increase. **The figure could reach $20 billion by 2027.**

https://www.infineon.com/cms/en/discoveries/electrified-ships/

Ships have been "semi-electric" for many years

Ships were driven by the wind for thousands of years. But from the start of the 19th century, this task was increasingly taken over by engines. After the invention of steam engines and turbines, diesel engines in various forms were also used in the 20th century. They burn fossil fuels – diesel, heavy oil, gas oil. Traditionally, this type of drive is mechanical: The diesel engine drives a shaft that then moves the ship's propeller. The engine or a generator also generates electricity for all the electrical systems on the ship.

But for several years, many ships have been partly electrified: 80 percent of oceangoing ships now use a diesel-electric transmission system. Diesel generators generate the electricity, which then drives the electric engine. This moves the ship's propeller. This has many advantages: It saves between five and 20 percent of the fuel. The electrical machines also consist of fewer components, are less prone to faults, and have less wear and tear. This translates into reduced energy loss and higher efficiency. But this is still not a hybrid drive system. This is the case only if the ship can sail without the diesel engines running, at least for a certain length of time. In this case, the energy comes from the batteries on board. In the future, the electric engine could also be supplied with energy by other means, such as with rechargeable batteries, liquefied natural gas (LNG) or solar power.

The first electric ships

Electric ships – how does that work?

The journey from internal combustion engine to emission-free drive involves various technologies. As with cars, electric commercial vehicles or electric planes, hybrid technologies are an interim solution for models where it is still difficult to implement a purely electric drive system.

What technologies are already available?

Diesel-electric drive: Diesel generators generate the electricity. The electricity then drives the electric engine, which moves the ship's propeller.

Hybrid drive: Batteries are on board in addition to the internal combustion engine. On the one hand, they can be switched on additionally for a short time when a power peak is needed. On the other hand, they can store surplus energy, such as from the diesel generator. This would allow the ship to sail using nothing but electricity for some time.

Fully electric drive: There is no internal combustion engine on board, all the energy comes from batteries.

Some inland vessels already sail using nothing but electricity, mainly ferries and pleasure boats. That's because they sail shorter distances and can therefore use smaller batteries. Several boat builders are also planning hybrid cruise ships. But for large cargo ships that sail the world's oceans electric drives are still a long way away. The batteries are still not efficient enough and are too heavy for ships that sail long distances on the high seas.

Fuel Cell: A fuel cell uses the chemical energy of hydrogen or other fuels to cleanly and efficiently produce electricity. If hydrogen is the fuel, the only products are electricity, water, and heat. Fuel cells are unique in terms of the variety of their potential applications; they can use a wide range of fuels and feedstocks and can provide power for systems as large as a utility power station and as small as a laptop computer

Fuel cells work like batteries, but they do not run down or need recharging. They produce electricity and heat as long as fuel is supplied. A fuel cell consists of two electrodes—a negative electrode (or anode) and a positive electrode (or cathode)—sandwiched around an electrolyte. A fuel, such as hydrogen, is fed to the anode, and air is fed to the cathode. In a hydrogen fuel cell, a catalyst at the anode separates hydrogen molecules into protons and electrons, which take different paths to the cathode. The electrons go through an external circuit, creating a flow of electricity. The protons migrate through the electrolyte to the cathode, where they unite with oxygen and the electrons to produce water and heat. Learn more about:

Continued development in rechargeable batteries

For an electric drive system to be "worthwhile" on a ship, batteries must therefore become consid-erably more efficient. Significant work has being carried out in this area: With "SAVe Energy", Rolls-Royce has developed a new battery system to electrify ships, which is widely available now. The company has been developing and producing energy storage systems since 2010, but in the past, the batteries came from external suppliers. The liquid-cooled system SAVe Energy is said to be highly efficient – and especially flexible: It can be used in fully electric or in hybrid ships, in ferries, cruise and cargo ships. With a liquefied gas or diesel engine, the system also provides support and reduces emissions. Initially, SAVe Energy will be delivered to Norwegian shipping company Prestfjord. Rolls-Royce expects a boost: In 2019 alone, shipping companies could install more batteries than in the eight years prior to this.

Alternative drive technologies

There are also other environmentally friendly alternatives to diesel, such as liquefied natural gas (LNG), which emits fewer pollutants and carbon dioxide when combusted. But LNG also has some disadvantages: On the one hand, a suitable infrastructure would have to be developed at the ports and on the ships. On the other, gas is also a fossil fuel and hence not infinitely available. In addition, gas can escape between production and use on the ship, what is known as methane slip. Methane has 25 times the effect of CO_2 on the climate and contributes greatly to the greenhouse effect, says Germany's Nature and Biodiversity Conservation Union (NABU). Currently, about 200 of 50,000 oceangoing vessels sail with LNG or are preparing to do so. Other shipping companies are also planning cruise liners with LNG drive systems. US-based Royal Caribbean plans to sail two cruise ships with fuel cells in the future. They burn liquefied natural gas as a fuel.

Technology group ABB and fuel cell producer Ballard are also backing fuel cells, but with an alternative, clean drive. They convert chemical energy into electrical energy. This energy then drives an electric engine. There is no combustion and no exhaust gases. ABB and Ballard want to make the existing technology also possible for larger ships. In spite of electric power of three megawatts and 4,000 HP, the system will not be larger than an internal combustion engine. The companies are focusing initially on large passenger ships. However, there is as yet no reliable time schedule for the project. Ballard has more plans: from 2021, the world's first hydrogen-powered sea-going ferry "HySeas III" will sail between two Scottish islands using fuel cells from the Canadian producer.

Solar boats are also on the water: the catamarans "SolarWave" and "Tûranor PlanetSolar" obtain their energy from photovoltaic cells on board. In 2012, the "Tûranor PlanetSolar" was also the first solar-powered boat to sail around the world. The journey took 585 days.

https://www.infineon.com/cms/en/discoveries/electrified-ships/

Electric Vessel Technology is the Future

As the world is changing, technologies that were the absolute norm, are now becoming old-fashioned. Up until now, ships have been sailing using fuels. However, it seems that electric vessels are gaining momentum, with many countries considering them as the future.

Electric vessels with energy storage in batteries and optimized power control can provide significant reductions in fuel consumption, maintenance and emissions.

A study by DNV GL shows how maritime batteries can contribute to achieving CO_2-reduction targets. The study shows that reducing CO_2 emissions in 2040 to below 2015 levels using green fuels will require the use of zero-emission options such as electricity and biofuels.

Additionally, in its latest Maritime Forecast to 2050, DNV GL believes that digital solutions could be vital to reducing shipping emissions. Namely, the report expects that the shipping GHG targets will be met. Carbon neutral fuels will play a crucial role, as by 2050, 39% of shipping energy will be provided from carbon-neutral fuels and 23% from LNG and LPG, a third of all ships will have electric batteries, thus contributing 5% of the market's energy demand.

As for electricity in general, DNV GL notes that it will contribute even more to the global energy demand reduce from the mid-2030s onwards. Namely, global energy expenditure on energy, as a percentage of GDP, will decrease by 44% by 2050.

The good news is that electric propulsion is feasible for every kind of ship. From cruise ships to icebreakers, tugboats, even war ships, as well as other marine applications, electric propulsion can improve operations in a sensitive environment.

This is what China also thinks. Speaking during a lunch that the Hong Kong Shipowners Association organised, Dr. Xie Xie, director of the Waterborne Transportation Research Institute at the Chinese Ministry of Transport, noted that the country considers LNG as a transitional fuel and believes that electric ships will define the future of shipping.

What is more, two reports Global Electric Ships Market Professional Survey Report 2018 and The Electric Ships Market research report, analyse the future of electric vessels until 2025.

The first report outlines the product price, specification, financial and technical details, and research methodologies to assist businesses expand their market operations.

The second report mainly presents the definition, types, applications and major players of electric ships market. As the report says, the main regions that will play a crucial role in the electric ships market are: North America; Europe; China; Japan; Middle East & Africa; India; and South America.

Battery Electric Ships; Plug-In Hybrid Electric Ships; Hybrid Electric Ships.

Currently, Norway is leading the attempts for an electric future in shipping. The electric revolution in the Norwegian maritime sector started recently, when the first electric transfer ferry for the Nor-wegian Roads administration was launched, proven both a zero-emissions solution and also with respect to reduced operational costs.

In fact, Norway's first batch of 63 new ferries is now being produced. What is more, fishing boats, supply vessels, research ships, yachts, and tugboats are also choosing electric propulsion instead of diesel-fuelled combustion engines. These developments made Norway's coast be called as Norway's Silicon Valley.

Moreover, in December 2015, the Norwegian parliament also passed a law requiring low- and zero-emission solutions for all national and local ferries, providing also financial support. Now more than 60 electric ferries are in the plans and are about to be put into operation in the next 34 years.

Finally, the Norwegian Parliament adopted a resolution to reduce cruise ships and ferries emissions in the Norwegian fjords, no later than 2026. This regulation aims to make the fjords the world's first zero emission zone at sea, while it will have a positive impact on transport, tourism, and the maritime industry.

https://safety4sea.com/are-electric-vessels-the-future-of-shipping/

Can electric ships become the number one choice?

Without a doubt, electric shipping has caused an enthusiasm to the industry. But, can this way of propulsion become the norm? DNV GL's director of battery services and products, Narve Mjøs believes that it can, as its advantages are more than its disadvantages. However, the appropriate infrastructure is needed for the uptake of electric ships.

In the same wavelength, Jan Kjetil Paulsen, Bellona, noted that electrification - as means for zero emission - gives a limited operating range.

Certainly, electric shipping is one of the solutions towards a zero-emissions future. Thanks to increasingly digitalized solutions and new technologies, doors are being opened for new agreements. As we have already witnessed, electrification of shipping is happening; new projects are being launched every day and also improved technology and products with optimized performance and efficiency are made available.

The road ahead remains challenging; however electrification projects are bow booming mainly in short sea shipping and inland waterways, while for deep sea shipping other solutions underway for both the short and long-term perspectives.

Source: https://safety4sea.com/cm-electric-vessels-are-making-waves/

Climate change, regulations and costs

In the coming years, shipping will have to change to environmentally friendly drive systems. This is why we will see an increasing number of electrically powered ferries and passenger ships. However, ships are in use for decades. Generally, cargo ships operate for 30 years, inland vessels for about 45 years, and passenger ships often longer. In other words, it will take some time before the shipping companies replace them. More than 7,300 cargo ships are in use alone in the EU. The Dutch electric ship builder Port-Liner assumes that it will take about 50 years until all of them have been replaced by electric models – at least at the current rate. Experts predict that it will be at least 20 years before we see the first fully electric oceangoing ships. The better the alternative drives work, the quicker this will happen. If battery density also increases and batteries work more efficiently, many ships will in future sail quietly and in an environmentally friendly manner.

In other words, electricity will also drive the ship's propeller in the future. But development continues; next, there will be no need for a captain on board. Specific plans for this already exist: The Birkeland, the container ship from Norwegian company Yara, will soon sail with a small crew – later autonomously. In 2030, less than 550 years after Columbus, the first enormous steel ships could be steering into the future autonomously and electrically.

https://www.infineon.com/cms/en/discoveries/electrified-ships/

6 ZEETUG (Zero Emission Tugboat) Development and Commercialisation

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6

ZEETUG (Zero Emission Tug-boat) Development and Commercialisation

ZEETUG®
Zero Emission Electric Tug Boat

A Success Story from Turkey

Over 40 years, NAVTEK[1] has grown into a highly specialist naval engineering and architecture, design and build company, guided by a commitment to technological excellence and an innovative forward-looking approach. NAVTEK is a highly specialist company in the maritime sector and innovative marine technologies including energy, fully electrical marine vessels, renewable energy, low carbon shipping port development. The company portfolio ranges from highly sophisticated world's first self-Propelled Floating Power Plants to world's first fully electrical TugBoat ZEETUG (www.navtek.net) to naval forces vessels for the governments to a special underwater archaeological research vessels. Navtek's unique visionary science-based approach is built on in-house solid engineering and design capacities, ship building capacity of the parent company Erkal International Transport and Trade Inc. (TK Tuzla brand name) and close collaboration with the academic research institutions and international partners. The recent full purchasing of NAVTEK by Erkal International Transport and Trade Inc (TK Tuzla) has brought significant financial resources to NAVTEK.

Green and innovative Technologies:

Hybrid and fully electrical (ZEETUG) marine solutions with the use of renewable energy sources, offshore floating wind turbine foundations, autonomous marine vessels, quick charging stations for electrical vessels, low carbon maritime shipyard and ports design and energy management, in-creasing economic efficiency (OPEX saving) customised with a help of AI (Artificial Intelligence) sup-ported software for energy and vessel management. The smart operation foundation for the low emission parts will consist of energy management & automation, data collection and monitoring, early fault detection and problem solving, multi-disciplinary coordination such as waste, wastewater management, port operations, cargo handling to optimise the overall management to achieve low carbon development objectives of the shipyard/ports.

1 NAVTEK NAVAL TECHNOLOGIES INC is 100% own by Erkal International Transport and Trade Inc (brand Name: TK Tuzla Shipyard), http://tktuzlashipyard.com/en/services

PICTURE 1 WORLD'S FIRST FULLY ELECTRICAL TUGBOAT IS ON DUTY IN TUZLA - İSTANBUL.

The world's first **Classification Society certified** fully electric tugboat the ZEETUG (zero emission electric tugboat) was built by Navtek and delivered to owner in June 2020 successfully. ZEETUG was a one and a half years of research and development project carried out by Navtek successfully which resulted in world's first tugboat that can operate whole day without being charged and no emission during operation. ZEETUG is also so silence that allows hight operations for tugs even in the ports located within residential districts, besides, the crew can listen the sound of water and wind. Navtek also developed Smart Tug Energy Management System (STEMS) software, the ZEETUG is the first real fully operational Classification Society certified vessel paves the way in to new era in the marine transport sector. This innovative design allows the vessels to operate full power with a higher instant torque and efficiency without harming the environment. The innovative STEMS software continuously monitors the ZEETUG's operations and optimises her energy management to extend her operation during the day without need for a new charge. Navtek has also built a fast-charging stations that can charge the ZEETUG in an hour. Based on this first vessels Navtek continue R&D studies for a new and more advanced model **60T BP** and **80T BP**.

ZEETUG®

Zero Emission Electric Tug Boat

Basic Facts and figures:

Zeetug represents the new generation green and high technology by being fully electric and re-chargeable with zero emission. This innovative design allows the vessels to operate powerful with higher efficiency in line with not harming the environment. With the aid of the modular system Zeetug can be custom build from 5T BP up to 75T BP.

Zeetug is also a smart tugboat. Navtek has developed the Smart Tug Energy Management System (STEMS) software, with the objective of optimizing the electric power consumption and extending her driving range. ZEETUG is a power efficient electric tugboat, capable of managing its energy and reach on longer distances.

ADVANTAGES OF ZEETUG:

- **CLIMATE AND EVNIRONMNETAL FRIENDLY;**
  VERY LOW MARINE NOISE AND "0" EMISSION such as CO2, NOx, PM2.5
- **BUDGET FRIENDLY;** UP TO 85% LOWER OPEX
- **SMART;** MANAGING ITS ENERGY
- **POWERFUL;** HIGHER MANEUVERING ABILITY
- **SAFE:** MEETS ANY IACS MEMBERS VALID RULES AND REGULATIONS

https://www.navtek.net/portfolio/ZEETUG-32T-BP---ZERO-EMISSION-ELECTRIC-TUG-BOAT/106

https://www.navtek.net/portfolio/ZEETUG-45T-BP---ZERO-EMISSION-ELECTRIC-TUG-BOAT/104

STATE OF ZEETUG AVAILABLE SERIES

Bollard Pull (t.)	ZETTUG5	ZEETUG30	ZEETUG45	ZEETUG55
Loa(m.)	11	18,7	25,5	27
B(mld.m.)	4,4	6,7	10,6	10,8
H(mld.m.)	2,06	4,65	4,27	4,7
T(bl.m.)	1,7	3,5	3	3,45
Total Motor Power (kW)	300	1900	2900	3440
Propellers (n)	2	2	2	2
Propeller diameter (mm.)	1000	1800	2200	2300
Steering Type	asd	conv.	asd	asd
Endurance@6 knots abt.	6h:18m @38 nm	5h:18m @31.8 nm	9h:30m @57.1 nm	10h:30m @63.3 nm
Endurance@7 knots abt.	3h:12m @22.1 nm	3h:54m @27.1 nm	7h:42m @54.1 nm	8h:36m @60.4 nm
Endurance@8 knots abt.	2h:6m @16.9 nm	2h:48m @22.2 nm	6h:30m @52 nm	7h:18m @58.5 nm
Endurance@9 knots abt.	1h:12m @10.4 nm	1h:48m @16 nm	4h:30m @40.1 nm	5h:6m @45.9 nm
Endurance@10 knots abt.	0h:48m @7.9 nm	1h:18m @13.1 nm	3h:24m @33.9 nm	3h:54m @39.2 nm
Estimated top speed (knots)	10,2	11,3	13,3	13,2
Proposed crew number	2	4	6	7

Bollard Pull (t.)	ZETTUG60	ZEETUG65	ZEETUG70	ZEETUG75	ZEETUG80
Loa(m.)	127,9	28,7	29,6	30,5	31,4
B(mld.m.)	11,1	11,4	11,8	12,1	12,5
H(mld.m.)	4,9	5	5,2	5,3	5,5
T(bl.m.)	3,5	3,55	3,6	3,65	3,7
Total Motor Power (kW)	3800	4100	4400	4700	5000
Propellers (n)	2	2	2	2	2
Propeller diameter (mm.)	2400	2500	2600	2700	2800
Steering Type	asd	asd	asd	asd	
Endurance@6 knots abt.	9h:54m @59.2 nm	10h:48m @64.8 nm	10h:6m @60.4 nm	9h:24m @56.2 nm	10h:0m @60 nm
Endurance@7 knots abt.	8h:0m @58.3 nm	8h:48m @61.4 nm	8h:12m @57.1 nm	7h:30m @52.7 nm	8h:0m @55.9 nm
Endurance@8 knots abt.	6h:48m @54.2 nm	7h:24m @59 nm	6h:54m @54.8 nm	6h:18m @50.3 nm	6h:36m @53.1 nm
Endurance@9 knots abt.	4h:42m @42.6 nm	5h:12m @46.4 nm	4h:24m @40 nm	4h:42m @42.5nm	4h:42m @42.5 nm
Endurance@10 knots abt.	3h:36m @36.4 nm	4h:0m @39.7 nm	3h:24m @34.3 nm	3h:24m @34.3 nm	3h:42m @36.6 nm
Estimated top speed (knots)	13,1	13,1	13	12,9	12,8
Proposed crew number	7	7	7	8	8

ZEETUG45

7 GLOBAL MARITIME SUBSIDIES

GREEN SHIPPING FINANCE

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GLOBAL MARITIME SUBSIDIES

Environmental subsidies involve financial support by the government of environmentally desirable activities. The support can come in the form of grants, low-interest loans, favourable tax treatment, tendering systems, and other financial assistance for products with desirable environmental characteristics.

Rethinking tonnage tax, domestic ship fuel exemptions and seafarer employment incentives could lead to better value for the more than €3 billion spent subsidising shipping each year in OECD countries, according to a news by International Transport Forum OECD report.

The International Transport Forum (ITF) report, 'Maritime Subsidies: Do They Provide Value for Money?', finds little evidence that the three subsidies (tonnage tax is described as a subsidised replacement income tax) have achieved their stated objectives. These include encouraging registering ships under local flags, employing local seafarers and expanding short-sea shipping connections.

"Local flags and seafarer employment within the EU have in fact declined," the authors wrote. "Short sea shipping connections in the EU are still fairly limited."

Subsidies have been used in European countries to level the playing field against flags of convenience and subsidies available in other developed countries. But ITF concludes that there are limited benefits in retaining nationally flagged vessels.

https://www.itf-oecd.org/sites/default/files/docs/maritime-subsidies-value-for-money.pdf

TABLE 1 CLASSIFICATION OF MARITIME SUBSIDIES

	Production					
	Enterprise income	Costs of production factors				
		Labour	Capital	Energy	Infrastructure	Knowledge
Direct subsidies	Operation subsidy Subsidy for war-time availability of ships State as owner or shareholder	Training subsidy Crew travel and relief costs	Grants to acquire ships Scarp-and-build grants Interest rate subsidies	Grants for: - Green shipping -Conversion to LNG -LNG bunkering -Shore power Bunkering infrastructure	Port infrastructure	Pilot project grants Technology grants Maritime cluster grants
Tax Expenditures	Corporate tax exemption (tonnage tax) Business tax exemption Dividend tax reduction	Personal income tax exemption Foreign earnings deduction	Capital gains tax exemptions VAT zero rate Accelerated depreciation Reduced tax for ship lease	Exemption of: -Fuel tax -Electricity tax Electricity below cost-price		
Other government revenue foregone	Debt write-off state- owned shipping firms Recapitalisation shipping banks	Social security exemptions Social costs of automation	Customs duties exemptions for ship construction inputs Favourable buy and lease back		Port fee reductions Canal fees	
Transfer of risk to government	Favourable loans and credit		Favourable non-market-based loans and guarantees for ship acquisition Export credits for shipbuilders		Loans for port infrastructure	Loans for maritime innovation
Induced transfers	Cargo reservation schemes Cabotage restrictions FDI restrictions Price fixing via shipping conferences	Domestic seafarer requirements	Domestic ship-built requirements			

The report notes further that the increased liquidity provided by subsidies may have instead had an adverse effect on shipping by increasing. By allowing some shipowners to renew or expand their fleets, the subsidies could have contributed to increased overcapacity.

"The resulting cargo peaks, increased ship sizes and subsequent consolidation of container shipping lines have had mixed impacts on ports and shore-based employment."

Further market distortions have been found in the form of tonnage tax schemes that encompass profits from terminal operations. "These benefits vertically integrated shipping companies that compete with independent terminal operators, ship operators and freight forwarders that do not have similar tax benefits," the report said.

The basis for some subsidies is not clear, the report finds. For example, the EU Energy Tax Directive exempts ship fuels from tax, although member states can limit the exemption. ITF suggests that this directive does not align well with EU policy on decarbonising transport and should be reconsidered.

The report suggests that subsidies should be redesigned with a focus on public policy goals including decarbonisation and reducing congestion and urban pollution. They should be explicitly tied to tangible goals and subjected to rigorous verification. Examples include the UK's training requirements and the Norwegian and Portuguese subsidy regimes favouring cleaner ships.

Source: https://fathom.world/how-to-get-more-from-maritime-subsidies/

https://www.itf-oecd.org/sites/default/files/docs/maritime-subsidies-value-for-money.pdf

8 GREEN SHIPPING FINANCE

GREEN SHIPPING FINANCE
www.zeetug.com

8 GREEN SHIPPING FINANCE

8.1. European electric ships market

The Europe Electric Ships Market is expected to reach USD 9,307.6 Million by 2030 with a CAGR of 11.05% during the forecast period, 2019 to 2030. There has been significant development of hybrid cruise ships in the last few years to reduce acoustic pollution, emission, and vibrations. In February 2018, Hurtigruten, a Norwegian expedition cruise company, unveiled the world's first hybrid cruise ship. It reduces fuel consumption and CO_2 emissions on the ships by 20% by sailing with electrical propulsion.

Kongsberg (Norway), ABB (Switzerland), Wartsila (Finland), Norwegian Electric Systems as (Norway), Corvus Energy (Canada), General Dynamics Electric Boat (US), MAN Energy Solutions SE (Germany), Vard (Norway), Siemens (Germany), and Leclanché SA (Switzerland), among others are some of the players focusing on developing new electric ships with advanced features such as autonomous and remotely modes of operation, use of fuel cells, and solar power for providing power to ships, and fully electric propulsion for large ships among others. There are opportunities for innovative companies to manufacture lightweight, high-density marine lithium batteries.

Due to the increase in demand for electric ships for fully electric passenger vessels, tugs, yachts, and cruise vessels, among others. Countries such as Norway, Finland, and Denmark have actively started replacing conventional passenger ferries with fully electric passenger ferries. Major developments in autonomous electric vessels that use fuel cells and remotely controlled electric vessels are also driving the market in Europe to grow. Based on the system, the power conversion segment of the electric ships market is projected to grow at the highest CAGR from 2019 to 2025 and from 2025 to 2030. In the next few years, more cargo and passengers will be transported on electric ships. This increases the demand for power semiconductor devices, as ships could not sail electrically without the power semiconductor devices in their powertrain. ABB, Kongsberg, Wartsila, and Siemens, among others, are some of the electric and hybrid propulsion manufacturers. These companies use converters with components in their systems and engines, and they convert direct current from batteries to alternating current for engines.

Source: Research Report Analysis, Size, Share, Trends, Analysis and Growth by Forecast to 2030

Jan 18, 2021 (Heraldkeepers) -- Europe Electric Ships Market.

http://www.sbwire.com/press-releases/electric-ships-market-is-projected-to-grow-at-the-highest-cagr-from-2019-to-2025-1320265.htm

Segmental Analysis

The Europe Electric Ships Market has been segmented based on Type, System, Range, Operation, Ship Type, Power, and End-Use.

Based on type, the electric ship's market has been segmented into fully electric and hybrid. The hybrid segment dominated the market with a valuation of USD 1,421.9 million in 2018 and is expected to reach USD 3,966 million by 2030. Ships with hybrid-electric propulsion systems produce less pollution as compared to conventional marine propulsion systems that involve the burning of heavy oil. In this system, the propeller shaft of the ship is connected to large propulsion motor, which can be driven by DC/AC power. The power for the propulsion motor is supplied by a diesel/natural gas generator and prime mover assembly.

Based on ship type, the Europe electric ship market has been classified as commercial and defense. The commercial segment is expected to exhibit a higher CAGR of 11.36% during the forecast period. Factors such as an increase in seaborne trade, rising maritime tourism industry, and implementation of the IMO Sulphur 2020 Regulation, the demand for electric ships for commercial applications is expected to increase during the forecast period. Additionally, the growing development of hydrogen fuel cell power systems for cruise vessels is also likely to drive the growth of the segment.

By end-use, the Europe electric ship market has been divided into newbuild & line fit and retrofit. The newbuild & line-fit segment is expected to register a higher CAGR of 12.05% during the forecast period. The newly build & line fit of electric or hybrid ships includes the design of ships according to its application and integration of electric or hybrid propulsion systems. The demand for newly-built electric or hybrid ships has been increasing in the last few years, but the initial cost of such vessels is very high.

Regional Analysis

The country-wise analysis of the Europe electric ships market covers the UK, Germany, France, Russia, Italy, Norway, Turkey, Sweden, Greece, and the rest of Europe.

Germany led the market with a valuation of USD 354.5 million in 2018, and the market is expected to reach USD 1,460.4 Million by 2030 at a CAGR of 12.52% during the forecast period. Market growth in the country is driven by increasing investments by companies such as Siemens, Kongsberg Maritime, and AKASOL AG.

The UK was the second-largest market with a valuation of USD 301.5 million in 2018. The market in the country is projected to exceed USD 1,116 million by 2030 at 11.52% CAGR. This can be attributed to the presence of major manufacturers such as BAE Systems plc and Rolls-Royce PLC in the country.

https://www.marketwatch.com/press-release/europe-electric-ships-market-research-report-analysis-size-share-trends-analysis-and-growth-by-forecast-to-2030-2021-01-18

Key Market Players

The major players in the electric ships market are Kongsberg (Norway), ABB (Switzerland), Wartsila (Finland), Norwegian Electric Systems AS (Norway), Corvus Energy (Canada), General Dynamics Electric Boat (US), MAN Energy Solutions SE (Germany) Vard (Norway), Siemens (Germany), Navtek (Turkey) and Leclanché SA (Switzerland), among others among others. These players have adopted various growth strategies such as contracts, acquisitions, expansions, new product launches, and partnerships & agreements to expand their presence in the electric ships market further.

https://www.marketsandmarkets.com/Market-Reports/electric-ships-market-167955093.html

Key Developments

In January 2020, Norwegian Electric Systems signed a contract with Fjord1 ASA, a global transport company to provide battery systems, and electrical and automation packages for the latter's three ferries.

In December 2019, Volvo Penta provided its marine engines to GS Marine Production AS for its three hybrid ferries. This contract enabled the company to strengthen its customer base.

In December 2017, Wartsila signed a Memorandum of Understanding (MOU) with Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd to develop advanced power and propulsion systems for ships.

Energy storage pioneer Corvus Energy is set to start development and production of sustainable, large scale maritime-certified hydrogen fuel cell systems. Production will be located in Bergen, Norway with Toyota onboard as key partner and supplier of mass-produced fuel cell technology.

Corvus is spearheading a collaboration with Norwegian partners Equinor, shipowners Norled and Wilhelmsen, ship design company LMG Marin, the NCE Maritime CleanTech cluster and R&D institution the University of South-Eastern Norway (USN) to develop and produce modularised and cost-effective PEM (Proton Exchange Membrane) fuel cell systems for the international marine market. The project has received EUR 5.2m in funding from state agency Innovation Norway bolstering Corvus' front-runner position in clean technology for maritime and other sectors. The development is scheduled to showcase its first marine fuel cell system onboard a vessel in 2023 and the product will be marine certified and available for commercial delivery from 2024.

Hydrogen will play a large and vital role in satisfying future global low-carbon energy demand. Although hydrogen is today a large market (c$80bn per annum), it is generally produced and consumed at the same site, for example in the production of ammonia or in the refining of oil. One of the reasons for this is that storing and transporting hydrogen using incumbent technologies is difficult, both physically and commercially.

As the hydrogen economy gains momentum, storing and transporting hydrogen become increasingly critical if low-cost, low-carbon hydrogen supply is to match demand. Liquid Organic Hydrogen Carrier (LOHC) is a disruptive technology that can meet this objective safely and economically. Furthermore, LOHC has the ability to establish hydrogen as a globally traded commodity.

Hydrogenious LOHC Technologies ("Hydrogenious"), the global leader in LOHC, is making this vision a reality.

https://www.marketresearchfuture.com/reports/europe-electric-ships-market-9516

https://corvusenergy.com/corvus-energy-to-start-development-of-maritime-fuel-cell-systems-with-hydrogen-fuel-cell-technology-supplied-by-toyota/

https://www.hydrogenious.net/index.php/en/2020/07/21/lohc-global-hydrogen-opportunity/

GREEN SHIPPING IS THE NEW GOLD

According to a 2018 report by the OECD International Transport Forum, 28 of the world's 100 largest ports, in terms of cargo volume, are offering port-based financial incentives such as a differentiated fee for greener ships to mitigate GHG emissions. The green port fees are based on indices like the Environmental Ship Index, Green Award, Clean Shipping Index & GG Emission ratings, which express the environmental performance of an individual ship.

But going green requires big investments in vessels, shipping infrastructure and innovation. Today, European banks are backing the idea of green shipping. For instance, the European Investment Bank (EIB) has signed framework agreements with Société Générale, ABN AMRO and ING to provide EUR 750 million for sustainable shipping, promoting the adoption of alternative fuels such as LNG and ballast water treatment technology. The program aims to support the financing of new, greener vessels, alongside environmentally friendly retrofitting of existing ships. As a part of this program, ING and EIB have recently signed a EUR 300 million agreement to support investments in the European maritime shipping market with a green innovation element.

https://www.hellenicshippingnews.com/green-shipping-is-the-new-gold/

There are a lot parties involved in the domain of maritime financing. Some of these parties are conventionally established in their method of operational activities while ship finance operators are unconventional yet established in their own singular way. This difference existing between the

many available ship financers creates a wide array of feasibilities for the people requiring maritime financial aid.

During 2020, green shipping finance becomes more evident by establishment of a number of new creativities such as Poseidon Principles consisting 20 private banks, the Green Shipping Fund and capital investment initiatives, which you will find details in following chapters.

8.2. Banks & other lending organisations

These are the conventional maritime financing service providers that exist. Banks as lending organisations take a detailed inventory about the firm approaching them for financial purposes. Only if they are satisfied with the company's credit worthiness or only if the company has a long-standing association with them, then the banks invest in with the required funds.

As collateral, the receiver of the finance is required to mortgage the ship or pay an initial deposit as per the bank's existing norms. The amount of initial deposit claimed by a bank is anywhere between 10 to 40%, while maritime financial assistance is provided for only about 60 to 80% of the intended commercial activity. The rate of interest is also variable depending on a bank's association with the party intending to opt for marine financing.

Source: https://www.marineinsight.com/maritime-law/what-is-maritime-finance/

According to the Wall Street Journal, Chinese Banks, which hold about the 25% of all ship finance and more in the shipbuilding sector, are expected to publish their own climate criteria in their ship financing portfolios in the two following years. Source: https://safety4sea.com/jp-morgan-shipping-loans-will-be-provided-only-to-green-vessels/

In coming chapters we will be looking into green shipping finance opportunities starting with large states owned development banks, then private banks and other type of finance opportunities such as capital investment or other modalities.

8.2.1. The European Investment Bank (EIB)

The EIB is the long-term lending institution of the European Union owned by its Member States. It makes long-term finance available for sound investment in order to contribute towards EU policy goals.

Overview of EIB's (European Investment Bank) lending activity in shipping

- EIB has been lending to the shipping industry for many years under its traditional lending programmes with large shipping corporates.
- Under the umbrella of the European Fund for Strategic Investments (EFSI): Green Shipping

Loan Programme.

- Under the umbrella of the Connecting Europe Facility (CEF): a new financial instrument to further support Green Shipping investments.

General Characteristics:

- EUR 250 million loan programme.
- Pilot phase focused on Mediterranean and Atlantic based EU ship owners who contract new built vessels with eligible projects.
- Expected to support around EUR 500 million of investments.
- Up to 50% of investment costs.

Source:https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=26985&no=3

Example 1: GREEN SHIPPING PROGRAMME LOAN

Reference: 20150742
Release date: 10 May 2016
Promoter – Financial Intermediary

ACCEPTABLE CORPORATE(S)
Location: EU Countries, Spain
Description: Financing of small shipbuilding projects including new vessels, conversion and retrofitting of vessels that promote sustainable transport, TEN-T and environmental protection

Objectives

The loan will be structured as a programme loan for a series of sub-loans to multiple ship owners with eligible projects to be implemented mainly in European shipyards.

Sector(s)

Transport - Transportation and storage

Proposed EIB finance (Approximate amount)
EUR 245 million
Total cost (Approximate amount)
EUR 500 million

Environmental aspects

The Bank will require that projects financed under this operation comply with applicable domestic and EU legislation, as appropriate.

Procurement

The Bank will require that projects financed under this operation comply with applicable domestic and EU legislation, where applicable.
Status: Approved - 16/06/2016

Source. https://www.eib.org/en/projects/pipelines/all/20150742

Example 2: Construction of a new LNG bunkering vessel for maritime use in Greece

Public Gas Corporation of Greece SA (DEPA) and the European Investment Bank (EIB) signed an agreement to finance with up to EUR 20 million the construction of a new LNG bunkering vessel for maritime use in Greece, which will be based in Piraeus.

With a capacity of 3,000 cubic metres of LNG, the vessel, which is the first of its kind in Greece and the Eastern Mediterranean, will be supplied with LNG at Revithoussa LNG terminal and will refuel ships both in Piraeus and other ports in Greece and the wider region, supporting the shift towards green shipping with more environmentally friendly fuels, in line with the new more stringent international regulations.

The agreement was signed by Konstantinos Xifaras, Chief Executive Officer of DEPA, and Andrew McDowell, EIB Vice-President, in the presence of the President of the Board of Directors of DEPA.

The loan is guaranteed by the European Fund for Strategic Investments (EFSI / Juncker Plan) and will cover 50% of the vessel's construction cost. For the construction of the vessel DEPA has secured an additional amount of EUR 8.9 million from the European Union under the European Action entitled "BlueHUBS", which is coordinated by DEPA and aims at expanding the use of LNG in maritime transport in the eastern Mediterranean.

https://www.eib.org/en/press/all/2020-029-financing-agreement-for-the-construction-of-the-first-lng-bunkering-vessel-for-maritime-use-in-eastern-mediterranean

8.2.2. The European Fund for Strategic Investments (EFSI)

EFSI, also called the Juncker Plan, is an initiative of EIB Group and the European Commission aimed at boosting the economy through mobilising private financing for strategic investments. EFSI was established in 2015 through an EU Regulation 2015/1017 of the European Parliament and of the Council of 25 June 2015 on the European Fund for Strategic Investments, the European Investment Advisory Hub and the European Investment Project Portal and amending Regulations (EU) No 1291/2013 and (EU) No 1316/2013 – the European Fund for Strategic Investments. EFSI is one of the three pillars of the Investment Plan for Europe. EFSI is a EUR 16 billion guarantee from the EU budget plus EUR 5 billion from the EIB's own capital.

EFSI has been integrated into the EIB Group and projects supported by EFSI are subject to the normal EIB project cycle and governance.

The EFSI will contribute to a modal shift in which, instead of by road, goods are transported by sea, which is considered the most sustainable transport mode for this type of cargo. This will help to reduce the overall climate impact of transport, and specifically the promoter's carbon footprint.

The ING and EIB Partnership facility is available to clients with a significant European interest for projects that anticipate the construction of new vessels, or retro fitting of existing vessels, with a green innovation aspect and applies to both inland shipping and seagoing operators. This sector risk bearing facility is meant for projects that will improve the environmental performance of trans-port vessels in terms of diminishing the emission of pollutants as well as increasing fuel efficiency. Projects should be proposed to ING and will be subject to ING's financial and non-financial risk acceptance criteria.

The European Investment Bank (EIB) is the long-term lending institution of the European Union owned by its Member States. It makes long-term finance available for sound investment in order to contribute towards EU policy goals. Last year the EIB provided some EUR 2.18 billion for projects in the Netherlands.

The European Fund for Strategic Investments (EFSI) provides first loss guarantees, enabling the EIB to invest in more projects that often come with greater risks. EFSI has already yielded tangible results. The projects and agreements approved for financing under EFSI are expected to mobilise almost EUR 380 billion in investments, including 10 billion in the Netherlands, and support 842 000 SMEs in the 28 Member States

The Green Shipping Guarantee Programme (GSGP) is a sector risk bearing facility supported by the Connecting Europe Facility (CEF) and the European Fund for Strategic Investments (EFSI), de-signed for projects that will improve the environmental performance of transport vessels in terms of reducing the emission of pollutants as well as increasing fuel efficiency. Projects should be pro-posed to the EIB's intermediary partners and will be subject to their financial and non-financial risk acceptance criteria.

Source: https://ec.europa.eu/commission/news/investment-plan-europe-ing-and-eib-provide-eu110m-spliethoffs-green-shipping-investments-2019-feb-28_en

Example: Installation of exhaust gas cleaning systems and ballast water management systems on 42 Spliethoff vessels.

Investment Plan for Europe: ING and EIB provide €110m for Spliethoff's Green Shipping investments €110.4 million loan for the installation of exhaust gas cleaning systems and ballast water management systems on 42 Spliethoff vessels part of €300 million joint EIB-ING green shipping partnership.

EIB financing supported under EU's "Juncker Plan" and "Connecting Europe Facility".

This will enable Spliethoff to be compliant with International Maritime Organisation (IMO) and EU regulations governing air emissions and prevention of the release of seaborne pathogens that are harmful to the marine environment. The EIB loan will be supported by the European Fund for Strategic Investments (EFSI), the main pillar of the Investment Plan for Europe, as well as the "Connecting Europe Facility" (CEF).

The loan is part of the ING and EIB €300m Green Shipping partnership signed in 2018, to support sponsors of green and sustainable projects in the maritime transport sector with advantageous financial terms. The EIB will contribute €49.5 million to a €110.4m ING Bank NV arranged facility to finance the installation of exhaust gas cleaning systems and ballast water management systems on 42 vessels for Spliethoff's Bevrachtingskantoor B.V. In specific 17 vessels will be retrofitted with both exhaust gas cleaning systems and ballast water management systems, 5 vessels with exhaust gas cleaning systems and 20 vessels with ballast water management systems.

The retrofitted vessels will operate with significantly reduced emissions of sulphur oxide (SOx) and particulate matter (PM) pollutants and prevent the sea borne transfer of invasive species and diseases in ballast water.

https://ec.europa.eu/commission/news/investment-plan-europe-ing-and-eib-provide-eu110m-spliethoffs-green-shipping-investments-2019-feb-28_en

8.2.3. Green shipping guarantee programme

The aim of the Green Shipping Guarantee (GSG) programme is to accelerate the implementation of investments in greener technologies by European shipping companies. The programme will be structured as a guarantee framework with financial institutions specialised in ship financing. In order to develop and demonstrate the concept, the programme will be launched with a pilot phase with selected partner institutions with identified pilot transactions.

Objectives

The greening of the transport sector is a key objective of the Trans-European Network policy.

Sector(s)

Transport - Transportation and storage

Proposed EIB finance (Approximate amount)

EUR 750 million

Total cost (Approximate amount)

EUR 3000 million

Environmental aspects

The Guarantee programme is intended to finance shipbuilding projects including new vessels, conversion and retrofitting of vessels that promote sustainable transport and environmental protection including Climate Action initiatives. Full assessment of the scope of each individual project will be performed during the corresponding appraisal. The ship owners/promoters are expected to be well established experienced operators of their vessels and are also expected to have the necessary competence to undertake the works proposed under the programme. They will also be expected to hold all relevant environmental certification for the construction of these types of vessels.

Procurement

Procurement issues will be assessed during each individual project appraisal. Each promoter, whether public or private, must demonstrate to the Bank that EU procurement procedures have been satisfactorily implemented for shipyard selection. The Bank will assess in particular whether open and fair selection tenders have been made with regard to shipyard selection and that no state aid or intellectual property right issues are outstanding with any of the selected yards.

Source: https://www.eib.org/en/projects/pipelines/all/20150334

III. Société Générale;

Shipping & Offshore Finance

They offer dedicated expertise and tailored solutions to leading ship owners around the world looking to fund the build, purchase and development of vessels and offshore projects, in both the commercial shipping sector and offshore oil and gas sector. They focus on those clients and sectors where we believe we can add most value – namely, financing for Industrial and LNG Shipping and Offshore sector projects. This includes both bank and capital market financing as well as advisory services for project and corporate financing.

Their leadership in structured finance together with a global network of investor, export credit agency and banking relationships means we can deliver complex and/or high-value shipping transactions on competitive terms, even in the toughest market conditions.

Societe Generale has been the first financial institution to join the SEA/LNG coalition, a multi-sector industry coalition aiming to accelerate the widespread adoption of liquefied natural gas (LNG) as a marine fuel. Under the Poseidon Principles, signed by Societe Generale to promote shipping industry decarbonisation, we finance and refinance vessels that comply with the International Maritime Organisation (IMO) 2050 emissions targets.

https://wholesale.banking.societegenerale.com/en/solutions-services/financing/asset-financing/

IV. ABN AMRO:

ABN AMRO is a member of the Sustainable Shipping Initiative (SSI), which brings together sector leaders whose activities minimise maritime pollution. These firms also want to be the best employers in shipping.

Maritime transport has quadrupled in the past twenty years. The SSI recognises the environmental impact of this, which is why its members are calling at the COP21 climate summit in Paris to step up efforts to cut CO_2 emissions. The aim is to contribute to a scenario in which the earth heats up by no more than two degrees.

Source:

https://www.abnamro.com/en/newsroom/blogs/jan-raes/2015/green-shipping-is-the-future.html

Example:

Cyprus/Netherlands: First green support for European shipping operator signed with ABN Amro

11 January 2019.

The European Investment Bank (EIB) announces the signature of the first agreement under its Green Shipping Guarantee Programme (GSGP) through ABN Amro. The EIB will contribute EUR 10.1 million to an ABN AMRO arranged facility to finance the construction of three cement carrier vessels for the Eureka Shipping group.

The project vessels' design represents an improvement to the overall environmental performance of the promoter's fleet, as well as cement carrier vessels currently operating in European waters. The new vessels, which will be laid up in the Netherlands, will operate with significantly better fuel efficiency and reduced emissions of pollutants.

All three new ships will be built and operated in compliance with IMO and EU regulations and will operate under an EU flag. They will serve northern European ports, predominantly in the Sulphur Emission Control Areas (SECAs) of the Baltic and North Sea.

The project will contribute to a modal shift in which, instead of by road, goods are transported by sea, which is considered to be the most sustainable transport mode for this type of cargo. This will help to reduce the overall climate impact of transport, and specifically the promoter's carbon footprint.

https://www.eib.org/en/press/all/2019-005-first-green-support-for-european-shipping-operator-signed-with-abn-amro

V. BNP Paribas

BNP is offering performance incentive loans to its shipping customers where the rate of interest charged falls when the clients' ESG score improves.

Meeting the requirements of IMO 2020 may lead to additional expenses – and green financing can play a key role. According to Nicolas Parrot, Head of Transportation Sector, Investment Banking Asia Pacific at BNP Paribas, the recent growth of green financing means there is now a range of ground-breaking solutions to support shipping firms that wish to reduce their environmental footprint. "The main options today available include green loans and bonds, and sustainability-linked loans (SLLs [3])," he says. "Within this mix, the range of expenditures that qualify for green financing has grown significantly in recent years."
https://cib.bnpparibas.com/sustain/greener-seas-financial-solutions-to-cut-sulphur-emissions_a-3-2992.html

VI. German KfW IPEX-Bank

KfW IPEX-Bank is the first German bank to join the initiative

With a lending volume of EUR 13.9 billion in 2017, KfW IPEX-Bank is one of the top 5 ship financiers in the world. KfW IPEX-Bank sets high standards regarding the environmental and social compatibility of its financing and is therefore the first German bank to join the Responsible Ship Recycling Standards in spring 2018.

KfW IPEX-Bank is one of the largest ship financiers in the world – too has adopted Responsible

Ship Recycling Standards to assess the energy efficiency of its shipping portfolio. It financed Germany's first LNG-powered ship by providing USD 81 million for equipment, 72 environment-friendly, battery-powered, automated guided vehicles (AGVs) and Battery Exchange Station for the Long Beach Container Terminal (LBCT) in California.

Furthermore, the evaluation verified that less energy efficient ships are associated with a higher credit risk. The compatibility of ecological and economical aspects for ship financing has now been empirically supported through the joint project of KfW IPEX-Bank and FutureShip.

Source: https://www.kfw-ipex-bank.de/International-financing/KfW-IPEX-Bank/Business-Areas/Mari-time-Industrie/Topthema-Green-Shipping/

HANSA, one of Europe's leading international maritime journals, took a closer look at the financing approach of KfW IPEX-Bank, which places much importance on supporting environmentally friendly shipping. Editor-in-chief Krischan Förster spoke at length with Holger Apel, Global Head of Maritime Industries.

LNG, electric drive, fuel cells, retrofits, scrapping clauses: shipping companies are trying in different ways to fulfill new environmental regulations and are ordering low-emission newbuilds or having their fleet retrofitted. This opens up many opportunities for banks: "We are even finding new possibilities beyond the newbuild business," said Apel. Given a worldwide fleet of 50,000 sea-going vessels and a service life of at least 20 years per ship, the requirements of the International Maritime Organization (IMO) cannot be met with newbuilds alone.

The bank wants to speed up the process through persuasion and is seeking partners for corresponding financings such as the credit insurer Euler Hermes. "With our efforts we want to show that KfW IPEX-Bank is precisely the right bank to contact for sustainable investments."
Source:

https://www.kfw-ipex-bank.de/Market-analyses/Standpoints/Taking-the-'green'-route-in-ship-finance/Taking-the-'green'-route-in-ship-finance.html

https://www.kfw-ipex-bank.de/International-financing/KfW-IPEX-Bank/Business-Areas/Mari-time-Industrie/Topthema-Green-Shipping/

8.3. Sustainable/green financing in the shipping and offshore sectors

8.3.1. The Equator Principles

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making.

The EPs apply globally, to all industry sectors and to five financial products: 1) Project Finance Advisory Services, 2) Project Finance, 3) Project-Related Corporate Loans, and 4) Bridge Loans and 5) Project-Related Refinance, and Project-Related Acquisition Finance. The relevant thresholds and criteria for application is described in detail in the Scope section of the EPs.

Currently 116 Equator Principles Financial Institutions (EPFIs) in 37 countries have officially adopted the EPs, covering the majority of international project finance debt within developed and emerging markets.

EPFIs commit to implementing the EPs in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to, comply with the EPs.

While the EPs are not intended to be applied retroactively, EPFIs apply them to the expansion or upgrade of an existing project where changes in scale or scope may create significant environmental and social risks and impacts, or significantly change the nature or degree of an existing impact.

The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the Project Finance market. They have also promoted convergence around common environmental and social standards. Multilateral development banks, including the European Bank for Reconstruction & Development, and export credit agencies through the OECD Common Approaches are increasingly drawing on the same standards as the EPs.

The EPs have also helped spur the development of other responsible environmental and social management practices in the financial sector and banking industry and have supported member banks in developing their own Environmental and Social Risk Management Systems.

Regarding Principle 3 ("Applicable Social and Environmental Standards"), refer to this page for the Designated Countries list.

The EPs are updated periodically. The latest iteration, EP4, was released on 18 November 2019. It came into effect for all EPFIs on 1 October 2020 and is supported by a suite of Guidance.

Source: https://equator-principles.com/about/

8.3.2. Green/Sustainable Bonds

One of the drivers for banks and financial institutions to extend green/sustainable loans is the potential ability to access a new type of investor base through the capital markets. Green or sustainable bonds can be issued, which differ from conventional bonds in that the issuer provides a set of green or sustainable criteria, and undertakes to use the capital raised for projects that meet that criteria. As a result banks and financial institutions may have capital earmarked solely for green or sustainable projects. Deploying that capital can require third-party opinions to confirm that the expenditure meets the criteria. It is worth noting that the EU is currently developing legislation on these criteria. If a project does not achieve the desired outcome and therefore falls outside the criteria for the bond, an investor may argue that the issuer has misled them. As a result, the bank or financial institution will require any project it invests in that uses such funds to report regularly and will set stringent criteria to ensure it remains compliant with the terms of any green/sustainable bond.

Green Bonds; Sustainability-linked margin ratchets

A developing trend, which we expect to continue as sustainability and the environmental impact of the shipping and offshore industries receives ever greater focus, is the economic incentivization of improved sustainability performance. SBM Offshore, a leading provider of floating production storage and offloading units, recently announced it had refinanced its revolving credit facility with a new facility including a margin ratchet that links the company's sustainability performance to the interest margin applicable to the facility. This ratchet provides for the applicable margin to increase or decrease by up to 0.05 percent per annum depending on the company's environmental, social and governance performance as measured by an independent third party, Sustainalytics. We are aware of other companies exploring similar margin ratchets with their relationship banks.

With regulatory changes and increased public focus on environmental matters driving change in the shipping and offshore industries and certain capital providers available and willing to finance that change, there is scope for the right projects to receive financing at the right price. If this mixture of regulatory impetus and technological and financial ingenuity leads to a greener and more sustainable shipping and offshore industry, we will all benefit.

(For Additional information please continue reading for summaries of Equator, Poseidon, LMA Green Loan and Sustainability-Linked Loan Principles.)

8.3.3. The Poseidon Principles

The Poseidon Principles are the world's first sector-specific, self-governing climate alignment agreement amongst financial institutions. They establish a global framework for assessing and disclosing the climate alignment of ship finance portfolios and are consistent with the policies and ambitions of the International Maritime Organization, including its ambition for greenhouse gas emissions to peak as soon as possible and to reduce shipping's total annual GHG emissions by at least 50% by 2050.

https://www.globalmaritimeforum.org/poseidon-principles

The Poseidon Principles (Principles) were launched on 18 June 2019 and were developed in response to the need of a global framework for responsible ship finance. The framework is designed to encourage financial institutions to include climate considerations in their lending decisions and to align their ship finance portfolios with responsible environmental behaviour and incentivise international shipping's decarbonisation in line with the climate goals of the International Maritime Organisation (IMO).

The IMO is the United Nations specialised agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. The Principles follow the IMO's goals announced in their Initial Greenhouse Gas (GHG) Strategy in April 2018 to reduce GHG emissions produced by shipping by at least 50% by 2050 (with 2008's emissions as the baseline).

The Poseidon Principles are applicable to lenders, relevant lessors, and financial

guarantors including export credit agencies. They apply globally, to all credit products secured by vessel mortgages or finance leases secured by title over vessel and where a vessel or vessels fall under the purview of the IMO. Currently, climate alignment is the only factor considered by the Poseidon Principles.

20 financial institutions have joined the Poseidon Principles. Together, they represent over US$150 billion in loans to international shipping – more than a third of the global shipping finance portfolio. The Principles were developed by global banks – Citi, Societe Generale, and DNB – in collaboration with leading industry players – A.P. Møller Mærsk, Cargill, Euronav, Gram Car Carriers, Lloyd's Register, and Watson Farley & Williams – with expert support by the Global Maritime Forum, Rocky Mountain Institute, University College London Energy Institute, and UMAS.

Sources: https://www.globalmaritimeforum.org/poseidon-principles

https://brodies.com/insights/banking-and-finance/the-poseidon-principles-and-their-implications-in-ship-finance/

https://www.newswire.ca/news-releases/poseidon-principles-15-financial-institutions-disclose-the-cli-mate-alignment-of-their-ship-finance-portfolios-807808972.html

The Principles

There are four principles:

Assessment of Climate Alignment: each signatory to the Principles has agreed by its accession to them, to take an annual measurement of the carbon intensity of their shipping portfolios and to assess the extent to which it aligns with the decarbonisation trajectory set out by the IMO. The trajectory being that which aims to meet the IMO's reduction of GHG referred to above.

Accountability: in order to ensure a level playing field amongst the signatories to the Principles, the information which is provided by them to satisfy the principle of Assessment of Climate Alignment relies solely on data types, sources and service providers established and identified by the IMO's Fuel Oil Data Collection Service (DCS). The DCS is mandatory for ships of 5,000 gross tonnage and above and which operate internationally. The DCS requires owners to collect consumption data of each type of fuel oil they use. The data is then reported to the flag state at the end of each calendar year by the vessel owners and the flag state is required to transfer this data to the IMO. Only when a flag state has determined that the data has been reported in accordance with the IMO requirements will it issue the ship with its Statement of Compliance.

Enforcement: obviously, for the Principles to deliver their intended purpose, there needs to be an equilibrium of obligations on those who are signatories. It is hoped that this will be aided by the inclusion in finance documentation of a standardised covenant clause (Standardised Covenant). The text of the Standardised Covenant is set out in the Principles and requires shipowners/opera-tors to provide certain data to their financiers relating to (amongst other things) their vessels' fuel consumption to enable the calculation of carbon intensity. This information is in line with what is to be provided to the DCS but whilst the provision of that information is mandatory, it is anonymised once provided to the IMO hence, the requirement for the covenant.

The inclusion of the Standardised Covenant is not compulsory by the signatories to the Principles in their financing documentation, but they are strongly recommended to include it.

Transparency: upon becoming a signatory to the Principles, the relevant signatory will publicly acknowledge that it is a signatory to them. In terms of reporting requirements, the first stage of the process commences in May of the second calendar year after a party becomes a signatory (and repeats every May thereafter). Once the relevant data becomes available through the DCS, signatories will collect the data from their shipowners and proceed to calculate the carbon intensity of vessels in their portfolio in order to assess the climate alignment at portfolio level. The portfolio climate alignment scores are then reported by 30 November with their publication by the Poseidon Principles Association occurring by 31 December of each year.

https://brodies.com/insights/banking-and-finance/the-poseidon-principles-and-their-implications-in-ship-finance/

The Organisation

The Governance Rules detail the scope of the roles of the Steering Committee and Chair and how representatives are nominated and appointed.

A secretariat maintains the day-to-day functions of the Association, and is the first point of contact for existing and prospective Signatories. The Secretariat is provided by the Global Maritime Forum through a service agreement.

The technical expertise needed for the Principles to remain updated and accurate is provided by Rocky Mountain Institute, University College London Energy Institute and Lloyd's Register and may include other organizations in the future as and when needed.

Signatories of Poseidon will, on an annual basis, measure the carbon intensity and assess climate alignment – carbon intensity relative to established decarbonization trajectories – of their shipping portfolios.

Assessing climate alignment

The Poseidon Principles use carbon intensity relative to established decarbonization trajectories to measure climate alignment.

Climate alignment is defined as the degree to which a vessel, product, or portfolio's carbon intensity is in line with a decarbonization trajectory that meets the IMO ambition of reducing total annual GHG emissions by at least 50% by 2050 based on 2008 levels.

The Poseidon Principles rely specifically on the Annual Efficiency Ratio (AER) as the carbon intensity metric. The AER uses the parameters of fuel consumption, distance travelled, and deadweight tonnage at summer draught.

To assess climate alignment of a single vessel, the vessel's annual carbon intensity is compared with the decarbonization trajectory for its ship type and size class. The climate alignment of a product and or portfolio is a weighted average of the vessel carbon intensities in each product or portfolio.

What is a decarbonization trajectory?

A decarbonization trajectory is a representation of how many grams of CO_2 a single ship can emit to move one tonne of goods one nautical mile over a time horizon. To assess climate alignment of a single vessel, the vessel's annual carbon intensity is compared with the decarbonization trajectory for its respective ship type and size class.

Standard decarbonization trajectories are produced by the Secretariat of the Poseidon Principles

for each ship type and size class.

https://www.poseidonprinciples.org/principles/assessment/

20 leading banks jointly representing approximately USD 150 billion in shipping finance have come together to commit to the Poseidon Principles

The following banks are signatories to the Poseidon Principles for green shipping finance.

ABN·AMRO

" Agreement and by the International Maritime Organization. Recognizing this, the Poseidon Principles offer the opportunity to improve the transparency of the climate impact of the shipping industry and align leading shipping bank portfolios with our climate goals in reducing GHG emissions. We are excited to see the Poseidon Principles come to life and we encourage all our ambitious peers to join in this initiative". ABN AMRO

EIB and ABN AMRO provide Eureka Shipping with environmentally based financing package, a first for any European shipping operator.

On 7 December 2018, the European Investment Bank (EIB) announced their agreement to finance the construction of three new cement carriers for Eureka Shipping Group, a joint venture between SMT Shipping and CSL Shipping. The finance vehicle will be administered under EIM's Green Shipping Guarantee Programme (GSGP) through ABN AMRO facility.

In announcing the agreement, EIB stated that its joint commitment with ABN AMBRO of EUR20.25 million towards the new building project supports Eureka Shipping's ongoing commitment to environmental stewardship: "The vessels' design represents an improvement of the overall environmental performance of the Sponsor's fleet, as well as cement carrier vessels currently operating

EIB's contribution to this important modernization and expansion of the Eureka fleet is a consequence of their belief that sea freight is among the most environmentally friendly means of commercial transport.

"The project contributes to a modal shift where, instead of by road, goods are transported over sea, which is considered to be the most sustainable transport mode for this type of cargo. This helps to reduce the overall climate impact of transport, and specifically of the promoter's carbon footprint."

All three new ships will be constructed and operated in compliance with IMO and EU regulations and will operate under an EU flag. They will serve northern European ports, predominantly in the Sulphur Emission Control Areas (SECAs) of the Baltic and North Sea.

hhttps://group.bnpparibas/

ttp://www.smtshipping.com/wp-content/uploads/Press-Release-1-ABN-EIB-Eureka.pdf

https://www.abnamro.com/app#/en/home

Amsterdam Trade Bank
Member of Alfa•Bank Group

"It Today we commit to the Poseidon Principles, to protecting our seas and our environment. We rise up to the challenge and take action to move your business forward. It is the right thing to do. We will adapt our business, we will help our clients, and together succeed."

Our bottom-up approach to financing means we work directly with shipping companies to help you see beyond short-term challenges and grow long term. Because ATB's team of shipping experts understands international trade flows and global shipping, you can be sure we share the focus on quality and reliability that your customers expect from you.

ATB is globally active. Our customer base is primarily in Western Europe, and we have a network of financial institutions that includes Alfa-Bank.

Are you looking to finance a vessel? We can help you finance the following vessel types:

- Dry-bulk carriers
- Crude and product tankers
- Container ships
- Gas carriers

ATB provides shipping finance both pre- and post-delivery.

CREDIT FACILITIES

Whether you are looking to expand your order book or refinance your existing vessels, our shipping loans will give you the funding you need to move your business forward. We offer bilateral loans, where we fund the full amount, but we can also tap into our network of financial institutions to provide you with greater access to other types of financing.

BONDS AND GUARANTEES

We offer a range of bond and guarantee types to mitigate risks during the build or delivery of vessels.

TREASURY SERVICES

Complementary to our financing services, our treasury services help reduce risks associated with foreign exchange movements and liquidity to shelter you from adverse market changes. We also offer deposit types for a number of currencies and different tenors.

Contact: Iraklis Tsirigotis

Head of Corporate Banking a.i.

https://www.amsterdamtradebank.com/about-you/ship-owners/

BNP PARIBAS

The bank for a changing world

"As a leading and longstanding lender to the global maritime industry, we welcome the establishment of the Poseidon Principles, an industry-wide and self-volunteered initiative that reflects our own commitment to combat climate change and protect the oceans" BNP PARIBAS

bpifrance ASSURANCE EXPORT

"By becoming a signatory of the Poseidon Principles, we aim at aligning our shipping financial portfolio with the sustainability objectives set by the International Maritime Organisation". Bpifrance Assurance Export

Bpifrance helps stimulate French business' growth by offering loans, providing guarantees and awarding buyer credit and supplier credit to encourage business abroad.

It finances over 80 000 companies and provided over 6000 investment loans and 50000 short term loans in 2018 with a total production of 19 billion euros. Bpifrance is also the innovation agency for entrepreneurs with 1,3 billion euros of innovation soft loans distributed to 6000 companies every year.

Contact: https://contacts.bpifrance.fr/serviceclient/conquer-the-world

"CIC is proud to become signatory of the Poseidon Principle aside other prominent international shipping banks. We consider that the Poseidon Principles is a major milestone to help the maritime industry in its necessary transformation in order to reach Paris Agreement's global warming target. Maritime transportation will continue to be a key sector for the global economy and we believe that the financial institutions have to play an important role to promote sustainable development and green initiatives in the global decarbonisation process. The Poseidon Principles will help all participants to achieve the GHG reduction goal and build up a greener industry for the benefit of future generations." Crédit Industriel et Commercial

Longevity through solidity and solidarity. A strong cohesive group with a proud heritage and culture.

The strength and stability of the Crédit Mutuel Alliance Fédérale provide a solid foundation on which we build the financial future of its clients. With over 7 million cooperative members, 30 million clients and more than EUR 30 billion in equity, CIC long-standing group is one of the best-capitalised banks in Europe.

https://www.cic.fr/fr/institutionnel/publications/rapports-annuels/index.html

http://www.cic.com.sg/contact-us/

"The maritime sector is a key facilitator of global trade. However, it's critical that all industry participants address the climate impacts of the shipping industry. As banks, we recognize that our role in the shipping industry enables us to promote responsible environmental stewardship throughout the global maritime value chain. The Poseidon Principles will not only serve our institutions to improve decision making at a strategic level but will also shape a better future for the shipping industry and our society." Citi

https://www.citigroup.com/citi/

CRÉDIT AGRICOLE
CORPORATE & INVESTMENT BANK

"The Poseidon Principles are a pioneering initiative by international shipping banks, one of the key stakeholders of the maritime transport sector, to support the transition to a low-carbon and climate resilient economy. The decarbonization of our Shipping industry is a fundamental requirement but also a major challenge that can only be tackled through such coordinated efforts. As a global leader in sustainable banking and shipping finance, Credit Agricole CIB welcomes the

opportunity to join and participate in the Poseidon Principles." Credit Agricole

Crédit Agricole CIB is resolutely focused on financing the real economy and supporting major projects that generate lasting momentum across all regions.

It features many commitments, which are in line with those of Crédit Agricole.

Two areas, project finance and green bonds, are of particular importance as potential action levers for banks and are suitable for greater analysis on their part. In these two areas Crédit Agricole CIB has strongly contributed to create standards of good practice with the Equator Principles and the Green Bonds Principles.

In other areas where it is more difficult to standardise practice, Crédit Agricole CIB has adopted CSR sector policies that detail the environmental and social criteria used by the Bank.

The Equator Principles

When the Equator Principles were launched in 2003, Crédit Agricole CIB became the first French bank to sign them. In a few short years, the Equator Principles have become the benchmark for responsibility in project finance.

The Equator Principles represent a voluntary, unilateral commitment to perform a detailed analysis of environmental and social aspects of each new project financing and to link financings to compliance with a number of requirements. Consequently, we develop and run our projects in compliance with the social and environmental standards of the International Finance Corporation (IFC).

Green Bonds are bonds exclusively reserved for financing projects or assets with an environmental and/or social purpose.

Crédit Agricole CIB is a co-founder of the Green Bond Principles and the only European bank that took part in drafting them in 2013.

Green Bond Principles create a framework for the use of proceeds, the process for project evaluation and selection, the management of proceeds and the reporting for the issuance of these Green Bonds. They offer investors the availability of the information required to evaluate the environmental impact of their investments.

These principles have become a market standard. In 2016 under the leadership of 3 banks, including Crédit Agricole CIB, they were extended to Social Bonds, by drafting Guidance for Issuers of Social Bonds.

Crédit Agricole CIB has been working in this market since 2010 and it has ever since been one of its top arranger worldwide. The Bank received the Global Capital Award SRI for the 6th consecutive year and IFR's ESG House of the Year award for the 5th consecutive year in 2019.

https://www.ca-cib.com/about-us/committed-and-responsible/our-sustainable-financing-policy

https://www.ca-cib.com/contact-us

CREDIT SUISSE

"The Poseidon Principles are key to leading industry-wide change. Along with our co-signatories, we aim to align our ship finance portfolio to be environmentally responsible and to lead by example in the reduction of GHG emissions. Joining the Principles shows our clear and continued commitment to sustainable shipping – being there to support our clients in their business and in their transition to a low-carbon shipping industry." Credit Suisse

https://www.credit-suisse.com/about-us/en/our-company/corporate-responsibility/environment.html

DANISH SHIP FINANCE

"Financial institutions play an important role in facilitating the transition towards sustainability in businesses and ensuring that we reach the global climate goals. Recognizing both our direct and indirect responsibility and being transparent are the first steps on this journey. In this respect, the Poseidon Principles is a forward-looking initiative within sustainable finance and positions the ship finance sector in a global leadership role. As a responsible institution Danish Ship Finance welcomes the opportunity to take part in this leadership role and we encourage all like-minded partners in the ship finance community to join the Poseidon Principles alongside us." Danish Ship Finance

DSF has been committed to ship financing since 1961 and is a trusted partner for Danish and international shipping companies. DSF is a highly specialised niche player dedicated to serving her customers to the highest standards of business.

DSF operates a loan book of approximately USD 6 billion secured by first priority mortgages in more than 800 vessels. A team of 80 people work out of one office in Copenhagen. The ship finance operation is supported by an in-house expertise within shipping research, marine insurance and marine surveillance.

DSF funded by the issuance of covered bonds on NASDAQ OMX Nordic and has been assigned an A bond rating and a BBB+ issuer rating by Standard and Poor's (with a stable outlook). As a ship finance institute, we are supervised by the Danish Financial Supervisory Authority.

DSF's Business Model

DSF operates on the basis of a simple and effective business model that builds on statutory access to solely operate ship financing business.

Danish Ship Finance offers one product only; loans secured by mortgages.

Based on a slim and very professional organisation with an efficient decision-making process, DSF offers a professional and competitive product to Danish and international shipping companies.

Lending Operations

DSF offers ship financing against security in vessels. DSF has built a diversified customer and ship portfolio, which in terms of geography covers a large range of markets.

Financing provided by DSF is based on the value of the vessel (the mortgaged asset) and projections for a vessel's earnings potential. Financing will not exceed 70% of a vessel's market value. Financing is always provided against first priority mortgage in the vessel and assignment in respect of the vessel's insurances. The term of the loan and other loan terms are agreed on an individual basis.

DSF places great emphasis on the borrower's financial strength and experience in shipping operations. DSF seeks to maintain low credit exposure in her loan portfolio.

Further information on the vessel types financed by DSF can be found here. https://www.shipfinance.dk/

Danske Bank

"As one of the leading financial institutions within the shipping industry, we recognize our role in addressing and promoting the sector's high ambition to decarbonize going forward. We believe that the Poseidon Principles will be an important initiative in this respect." Danske Bank

Danske Bank is a Nordic bank with strong local roots and bridges to the rest of the world. For more than 145 years, the bank have helped people and businesses in the Nordics realise their ambitions.

DB wants to help to potential clients to become financially confident and help them build their lives and businesses on a solid financial foundation, aiming to create long-term value for all their stakeholders –customers, shareholders and the societies that are part of – and DB's vision is to be recognised as the most trusted financial partner.

Main number:

+45 33 44 00 00

email at danskebank@danskebank.dk

https://danskebank.com/about-us

DNB

"The Poseidon Principles are ground-breaking in both the spheres of shipping and sustainable finance. Now is the time to advance the role of banks in addressing global environmental issues. We encourage all our colleagues to join us in leading industry-wide change by becoming Signatories of the Poseidon Principles." DNB

With a green loan from DNB, you may receive financing for investments with sustainable solutions. Green loans support important environmental needs, and provide security to investors through third party verification.

What is a green loan?

A green loan is a type of financing where funding goes to projects and investments with environmental benefits. We have established an overall framework that indicates which activities qualify for green loans in collaboration with the leading ESG rating provider Sustainalytics. DNV GL assess each loan and issue a green certificate for eligible loans based on objective criteria. For real estate and construction, the sector specific certifications BREEAM, LEED, and Svane are used for the same purpose.

What does this mean for you?

This means that your company can finance and refinance green activities, such as renewable energy and energy efficiency projects. In the process, we consider the following:

Which green projects and investments are financed?

Which environmental effects does the company achieve?

How is financing followed up by the company?

How is the reporting conducted?

DNB's framework is based on the Green Loan Principles (GLP) which are general guidelines established by global financial players.

"With our clients, investors, and at society as a whole, we are seeing an ever-stronger focus on sustainability and corporate responsibility. The green transition brings challenges and opportunities, and we want to help our clients to make sustainable investments. We offer advise and capital to promote increased wealth creation at a lower cost to the environment."

Contact:

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Postal address:

DNB, Postboks 1600 Sentrum, 0021 Oslo

call +47 915 04800

https://www.dnb.no/en/corporate-and-institutions/green-loans.html

"The Poseidon Principles are unique as it is the first time that such a variety of shipping banks with involvement of a number of leading shipowners, have collectively signed up to this important initiative. The Poseidon Principles will give a clear signal that financial institutions want to support – and play their role in the decarbonization of the world fleet; Now that the shipping industry is about to commence a new era in its evolution to a greener industry, the launch of the Poseidon Principles could not come at a better time." DVB Bank SE

https://www.dvbbank.com/

EKSPORTKREDITT
Export Credit Norway

"As a public provider of long-term financing we are committed to ensure sustainability and corporate responsibility. The Poseidon Principles is a valuable initiative to make information about carbon emissions more easily accessible. Quantifying emissions and sharing information is necessary to combat carbon emissions and thereby reduce climate risk. Export Credit Norway is happy to join forces with other leading shipping banks." Export Credit Norway

Export Credit Norway can now provide financing for Norwegian purchasers of vessels built at shipyards in Norway and intended for use in Norway. Qualifying purchases include fishing boats, ferries, well-boats, express boats and vessels intended for local shipping, as well as related equipment and services.

Export Credit Norway is authorised to make loans supported by either guarantees from banks with strong credit ratings and/or GIEK.

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NO-0254 Oslo

TEL: +47 22 31 35 00

https://www.eksportkreditt.no/en/new-ship-financing-scheme-now-open/

https://insights.nordea.com/en/sustainability/sustainable-shipping/#

ING

"Banks have an important role to play in promoting sustainable development. The Poseidon Principles fit perfectly with our Terra approach, our strategy to steer our portfolio towards the Paris Agreement's well-below two-degree goal. The Principles will be integrated into this approach to support our ambition. It's encouraging to see so many banks collaborate for a low-carbon future and we are delighted to be part of this important initiative." ING

https://new.ingwb.com/

Nordea

"As the largest financial services group in the Nordic region it is very important to join other leading banks in this initiative to promote a responsible shipping industry, and to contribute to raised awareness. By becoming Signatories of the Poseidon Principles, we want to play an active role in reducing the global carbon footprint and contribute to a cleaner and more sustainable environment for future generations." Nordea Bank

Financial market actors are among the key stakeholders and levers for driving progress in the industry. They have a significant influence across the shipping value chain in terms of being able to demand action.

The Climate Bonds Initiative has launched criteria to steer investments in the shipping industry,

rewarding those not carrying fossil fuels and those operating zero-emission vessels or targeting to become zero-emission. And it's not just about ship owners. Charterers are also helping to drive the requirements for low-carbon initiatives through the supply chain, having those requirements put into their contracts and reporting on that. The more these initiatives are shared across the value chain and incentive-driven, the more they will be taken up.

Making the shipping industry more sustainable is a collective challenge, requiring engagement from all actors across the value chain – whether it's decarbonisation, responsible ship recycling, or safeguarding labour and human rights for seafarers and other shipping workers. Finance has the power to provide guidance and support, sharing its knowledge of what is possible and partnering with the industry to bring about positive change.

See the Sustainable Shipping Initiative's Roadmap to a sustainable shipping industry, which outlines key milestones to be achieved over the coming decades across six vision areas: Oceans, Communities, People, Transparency, Finance and Energy.

The Sustainable Shipping Initiative is a multi-stakeholder collective spanning the entire shipping value chain, from charterers, shipowners, shipyards, banks and NGOs, working towards a more sustainable maritime industry.

https://www.nordea.com/en/

https://insights.nordea.com/en/sustainability/sustainable-shipping/#

SEB

"Global challenges need global collaboration. SEB is committed to supporting its customers in the transition to a more sustainable world, and we are pleased to join a group of world leading banks in this new global framework for responsible ship finance." SEB

https://sebgroup.com/large-corporates-and-institutions/our-services/shipping-finance

SOCIETE GENERALE

"*The Poseidon Principles offer significant benefits to banks, the global shipping industry and to society as a whole. They allow us to align and de-risk our portfolios in line with shipping's green transition. We will work in partnership with our clients and partners on an ongoing basis to secure a successful implementation of the Principles.*" Société Générale

SG offers a broad range of products, including capital-raising, risk management, financing and advisory services in project finance, public private solutions, operating leases or export leases and

asset finance.

Based on asset and sector expertise as well as structuring skills in regulatory compliance and accounting areas, we offer tailor-made solutions in dedicated sectors such as:

- Transportation: ground (trains, subways and buses), sea (ports, vessels, cranes,...), air (airports, aircraft, aviation,...), road, logistics and support services
- Public services: health, education, public infrastructure, defense and custodial
- Commercial Real Estate
- Environment: water, waste, wind, photovoltaic and solar farms.
- Sectorial expertise: focus on Shipping, Aviation and Real Estate Finance
- Shipping & Offshore Finance

SG offers dedicated expertise and tailored solutions to leading ship owners around the world looking to fund the build, purchase and development of vessels and offshore projects, in both the commercial shipping sector and offshore oil and gas sector. We focus on those clients and sectors where we believe we can add most value – namely, financing for Industrial and LNG Shipping and Offshore sector projects. This includes both bank and capital market financing as well as advisory services for project and corporate financing.

Our leadership in structured finance together with a global network of investor, export credit agency and banking relationships means we can deliver complex and/or high-value shipping transactions on competitive terms, even in the toughest market conditions.

Societe Generale has been the first financial institution to join the SEA/LNG coalition, a multi-sector industry coalition aiming to accelerate the widespread adoption of liquefied natural gas (LNG) as a marine fuel. Under the Poseidon Principles, signed by Societe Generale to promote shipping industry decarbonisation, we finance and refinance vessels that comply with the International Maritime Organisation (IMO) 2050 emissions targets.

https://www.societegenerale.com/en

https://wholesale.banking.societegenerale.com/en/solutions-services/financing/asset-financing/

SpareBank 1 SR-BANK

"The shipping industry is a key sector in the transition to a low-carbon economy. SR-Bank is pleased to join this important initiative and we will continue to support Norwegian ship-owners in their continuous efforts to contribute to a greener industry. "SpareBank 1 SR-Bank

Sparebanken Vest

" To play their part in halting the climate crisis, banks should cooperate wherever they can, whilst competing where necessary. This is what the Poseidon Principles are all about – a proactive initiative where shipping banks commit to integrate specific measures into their financing of the shipping industry. We look forward to interacting with shipowners on these issues, and encourage other banks to follow suit" Sparebanken Vest

https://www.spv.no/

SparbankenVest

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SuMi TRUST
SUMITOMO MITSUI TRUST BANK

"As the first among Asian financial institutions, SuMi TRUST Bank is honoured to have the opportunity of becoming a signatory of the Poseidon Principles.
Source: https://www.smtil.com/about-us.html

8.4. Marine Money Lenders

Moneylenders too, form a vital part in the domain of shipping financing. While moneylenders are not opted for by companies primarily for maritime financial assistance purposes, they nonetheless provide valuable assistance when aid from banks and other recognized financial organization is denied.

The most important and note-worthy aspect of loaning marine finance from moneylenders is that their repayment options are tricky and costly at the same time. Unlike banks which have a pre-scribed set of rules and stipulations, moneylenders do not fall under the ambit of these stipulations which could cause problems for parties opting for moneylenders as a lending option. Source:https://www.eksportkreditt.no/en/our-financing-solutions/

Bonheur ASA

Bonheur ASA ("Bonheur") is a holding company with an origin tracing back to 1848. Bonheur and its subsidiaries ("Group") have a diversified focus, which has shifted over time. Traditionally, the majority of activity has been linked to maritime and energy related sectors. Over the last decades the Group and other Fred. Olsen related companies have been pioneers within the renewable energy sector. The first investment in onshore wind farms was made already in 1996.

Through more than a quarter of a century during the green energy transition a significant track record and competence has been built with investments in renewable energy related businesses. By way of example, taking advantage of the Group's collective experience from shipping and onshore wind farm development, it also expanded into the offshore wind installation industry in 2008. As of 2020, Bonheur and other Fred Olsen- related companies control ten various businesses across the renewable energy value chain employing around 2,000 people working in over 40 countries.

Bonheur is currently invested in four defined business segments; Renewable energy, Shipping/Offshore wind, Cruise and Other investments. The Group's green footprint has increased over the last decade driven by a long-term commitment to sustainable development and energy transition. The EBITDA from renewable energy and offshore wind activities of the Group has increased over the last five years and by YE 2019 constituted close to 90% of the groups EBITDA.

Bonheur is domiciled in Norway, with its headquarters in Oslo and has been listed on the Oslo Stock Exchange since 1920. The day-to-day operation of Bonheur is performed by the management enterprise Fred. Olsen & Co. Process for Project Evaluation and Selection Green Finance Instruments issued under this Green Finance Framework will solely finance assets in line with the criteria described above. To evaluate and select Green Projects, Bonheur has established an internal Green Finance Committee, consisting of members from finance, operations/technical and HSEQ departments in Fred. Olsen & Co and relevant subsidiaries of Bonheur. Relevant business units within the Bonheur Group will nominate projects to be evaluated by the Green Finance Committee who will be in charge of including eligible Green Projects in the Green Project Portfolio.

Safety, sustainability and quality are always key factors in the decision-making processes for Bonheur and its subsidiaries. Where relevant, a part of the green evaluation process will be to ensure that investments will contribute to reducing the relative environmental footprint of the operation, or the value chain it forms part of. Expected reduction will then be quantified to support the decision-making process. The finance department of Fred. Olsen & Co will on behalf of Bonheur, keep a list of evaluated and selected Green Projects. All decisions made by the Green Finance Committee will be documented and filed for transparency purposes.

Source: https://mb.cision.com/Public/2031/3190045/8418623f5683a558.pdf

TRANSPORT TRANSFORMATION

Clean Shipping Finance

Transport Transformation is a Swiss financial service provider for the international marine industry. TT's objective is to combat climate change by eliminating high initial investments of clean shipping projects through innovative financing solutions.

TT arranges funding for low- or zeroe-mission vessels and clean shipping equipment using mature, proven technologies - like the ZeeTug. TT structures financing and arranges funding tailored to size, technical solution and geographical location. TT provides leasing, power purchase agreements loans or others over the life cycle of the financing. In addition, TT offers advisory for financing concepts, investor acquisition and clean-shipping technology.

TT provides it's services globally with a traditional regional focus on Europe (EEA) and Asia Pacific (RCEP).

"Power Purchase Agreement"

A tailored Power Purchase Agreement by TT helps to significantly reduce the investments for all-electric vessels. In this model the client purchases the bare vessels only, without the on-board energy storage system (ESS) and shore power infrastructure. This equipment is provided by TT together with the electric energy as part of a long-term Power Purchase Agreement. The client is charged for actual electric energy (MWh) consumed on-board. This may be treated as operating cost instead of capital expenditures.

Conventional

Supply agreement for Bunker Fuel/Diesel deliveries.

Operating costs (OPEX) comprise costs for

- Bunker Fuel / Diesel Fuel
- Carbon Emissions (EU: from 2022)
- Combustion Engine Maintenance

Zero Emission Vessel

Power Purchase Agreement (PPA) for full-service on-board energy supply.

Operating costs (OPEX) comprise costs for

- Electric or Mechanical Energy
- Use of On-Board Energy Storage
- Use of Charging Infrastructure

TT arranges funding, legal structures and management of long-term service contracts.

"This model is suited for medium or large size projects with three or more ZeeTugs".

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J.P Morgan

J.P. Morgan highlights that the environmental protection will be a key consideration for expanding shipping loans.

During the International Shipping Week, Andy Dacy, Chief Executive of J.P. Morgan, reported that everyone in the Western World are thinking about the impact of environmental, social and governance factors, adding that only those who will follow a sustainable path will be able to acquire a capital.

Mr Dacy further stated that the loans and capitals will be provided to those who not only focus on the protection of the environment, but also to those who respect their crew, and are easy-to-collaborate with constituents in the industry to create a transparent organization.

In addition, Mr Dacy noted that the last ten years financing decision in the industry were taken by private-equity firms coming into shipping; Today, given that the private sectors look to exit the industry, institutional investors are looking beyond balance sheets to guarantees by shipowners that they will abide by the IMO climate regulations and timelines.

Source: https://safety4sea.com/jp-morgan-shipping-loans-will-be-provided-only-to-green-vessels/

Two state-owned Chinese banks, Bank of China and Export-Import Bank of China (China Exim), are the big lenders to shipping accounting for $33.5bn in loans as at end-2018, according to Petrofin Research.

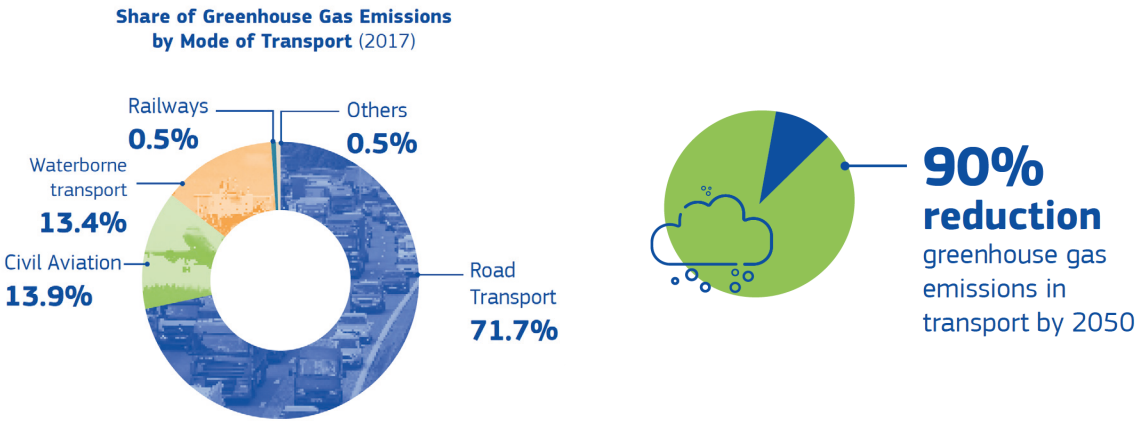
Other big Asian players include the Export-Import Bank of Korea, China Development Bank, Korea Development Bank, Hiroshima Bank, Japan Bank for International Cooperation and Singapore's DBS Bank.

At the Global Maritime Forum by a group of global shipping banks – Citi, Societe Generale, and DNB held in Singapore last October, Michael Parker, chairman, global logistics and offshore for Citi, expressed optimism in bringing onboard Asian banks. Kristin Holth, executive vice president, global head of ocean industries at DNB, weighed in to concur it is "important now to get more banks, Asian but also American."

https://www.seatrade-maritime.com/finance-banking/poseidon-principles-add-bnp-paribas-and-credit-suisse-asian-financiers-remain

8.5. EU Level Green Shipping Financing

EU Policy on Decarbonisation Policy on Maritime Sector



Source: Statistical pocketbook 2019

Shipping emissions represent around 13% of the overall EU greenhouse gas emissions from the transport sector (2015).

In 2013, the Commission set out a strategy Search for available translations of the preceding link towards reducing GHG emissions from the shipping industry.

The strategy consists of 3 consecutive steps:

- Monitoring, reporting and verification of CO_2 emissions from large ships using EU ports
- Greenhouse gas reduction targets for the maritime transport sector
- Further measures, including market-based measures, in the medium to long term.

The contribution of the shipping sector to emission reductions consistent with the temperature goals of the Paris Agreement remains an important issue in the EU.

The recent amendment to the EU Emissions Trading System (ETS) Directive, by Directive (EU) 2018/410 of the European Parliament and the Council, emphasises the need to act on shipping emissions as well as all other sectors of the economy. The Directive also states that the Commission should regularly review IMO action and calls for action to address shipping emissions from the IMO or the EU to start from 2023, including preparatory work and stakeholder consultation.

The EU is leading in de-carbonisation of the society with a clear CO_2 reduction targets till 2050 and provides massive financial support for research and development for the green shipping and maritime sectors. The EU Member States are obliged to follow the EU Commission decisions regards to de-carbonisation objectives of the EU and provide support to the maritime sector to overcome these challenges.

What does this mean for green ship finance?

The EU Green Deal calls under the Horizon 2020 programme.

The European Commission has launched in September 2020 a €1 billion call for research and innovation projects that respond to the climate crisis and help protect Europe's unique ecosystems and biodiversity.

The European Green Deal provides an action plan to

- boost the efficient use of resources by moving to a clean, circular economy
- restore biodiversity and cut pollution

The plan outlines investments needed and financing tools available. It explains how to ensure a just and inclusive transition.

The EU aims to be climate neutral in 2050. The proposed a European Climate Law will turn this political commitment into a legal obligation.

Reaching this target will require action by all sectors of our economy, including

- investing in environmentally-friendly technologies
- supporting industry to innovate
- rolling out cleaner, cheaper and healthier forms of private and public transport
- decarbonising the energy sector
- ensuring buildings are more energy efficient
- working with international partners to improve global environmental standards

The EU will also provide financial support and technical assistance to help those that are most affected by the move towards the green economy. This is called the Just Transition Mechanism. It will help mobilise at least €100 billion over the period 2021-2027 in the most affected regions.

https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#actions

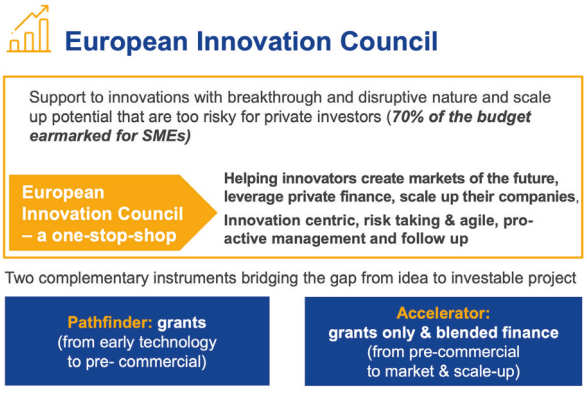
Bringing the maritime sector to heel was one of the most tangible ideas proposed by the Commission's Green Deal in December, under which shipping is set to be included in the EU Emissions Trading System (ETS).

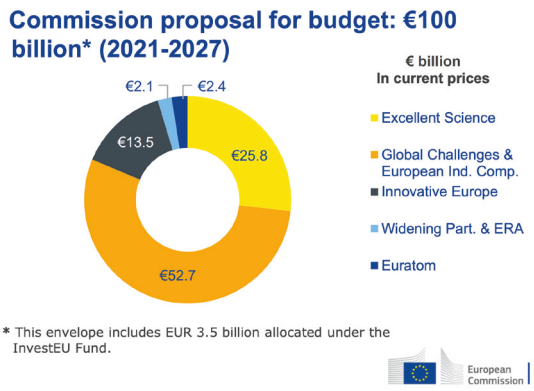
According to EU officials, the Commission is now working on preparing the ground for an ETS-extension proposal and it could be published at the earliest in mid-2021.

https://www.euractiv.com/section/shipping/news/eu-starts-to-chart-shippings-new-green-course/

A new EU support covering 2021 – 2027

The Commission welcomes the political agreement between the European Parliament and the Council on Horizon Europe, the largest transnational programme ever supporting research and innovation. The new EU research and innovation programme will have a budget of around €95.5 billion for 2021-2027 (current prices). This includes €5.4 billion (current prices) from NextGenerationEU to boost our recovery and make the EU more resilient for the future, as well as an additional reinforcement of €4.5 billion (current prices). This represents a 30% increase vis-à-vis the current research and innovation programme, Horizon 2020 (comparing Horizon Europe against Horizon 2020 for EU27, in constant prices) and makes it the most ambitious research and innovation programme in the world.





Source: https://ec.europa.eu/commission/presscorner/detail/en/IP_20_2345

https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_horizon-europe-overview.pdf

The European Investment Bank

The EIB has signalled its desire to clean up the industry, announcing its Green Shipping Financing Programme, which provides advantageous financial terms to sustainable projects. The initiative (also referred to as the Green Shipping Guarantee Programme) aims to support the financing of new, greener vessels, alongside environmentally friendly retrofitting of existing ships. The €750 million project focuses on sustainable shipping, promoting the adoption of alternative fuels such as LNG and ballast water treatment technology. The framework guarantee agreement ensures that advocates of sustainable projects benefit from favourable financial terms, which stem from the EIB's AAA rating.

As part of the Green Shipping Financing Programme, the EIB has signed framework agreements with Société Générale, ABN AMRO and ING. The facilities will be available to clients with significant European interests, and can be used for projects with a green innovation element covering the construction of new vessels or retrofitting of existing vessels.

The Green Shipping Financing Programme has already seen some early success. The EIB, Société Générale and Brittany Ferries announced the first financing to be put in place under the program in December 2017. The new vessel Honfleur will be Brittany Ferries' first LNG powered ferry and is scheduled to enter into service in April 2019.

Indeed, Société Générale is at the forefront of promoting the use of LNG as a marine fuel. In January 2018, the bank joined SEA\LNG, a multi-sector industry coalition aimed at accelerating the adoption of LNG as a marine fuel.

The Green Loan Principles (GLP),

The GLP launched in 2018 by the Loan Market Association (LMA). There are currently no "market standard" provisions for sustainable loans and the aim of the GLP is to provide a high-level framework of market standards and guidelines. They comprise voluntary recommended guidelines to be applied by market participants on a deal-by-deal basis and seek to promote integrity in the development of the green loan market by clarifying the instances in which a loan may be categorized as "green." The GLP are based around four core components: 1) the use of proceeds, 2) the process for project evaluation and selection, 3) the management of proceeds and 4) reporting. The LMA's indicative categories of eligibility for green projects include pollution prevention and control, and clean transportation.

Another development worth noting is the launch, in February 2018, by the European Bank for Reconstruction and Development and the International Maritime Organization of a strategic partnership to promote sustainable maritime transport. The partnership is enshrined in a Memorandum of Understanding under which the two parties will exchange know-how and experience, and will work to support governments in implementing frameworks for a fair, effective and sustainable maritime industry.

Only time will tell what impact these new initiatives will have on making the maritime transport

industry greener. In the meantime, it is clear that the industry is moving toward a more sustainable future, and the development of green ship financing is certainly one to watch.

https://www.assetfinanceinbrief.com/2018/10/financing-green-shipping/

Examples from EC funded green shipping programme

Network of regional maritime technology cooperation centres to be established through €10 million funding contribution.

An ambitious IMO project to establish a global network of Maritime Technology Cooperation Centres (MTCCs) in developing countries is to go ahead thanks to a €10 million funding contribution from the European Commission (EC).

The funds mobilised by the EC illustrate the EU's commitment to support the concrete implementation of a range of measures aimed at addressing energy efficiency and shipping emissions and, through this, contributing to the fight against climate change. This IMO energy-efficiency project is part of the Commission's broader climate financing portfolio aimed at helping less developed countries take climate actions in specific fields or sectors such as the shipping sector.

The aim of the project will be to help beneficiary countries limit and reduce greenhouse gas (GHG) emissions from their shipping sectors through technical assistance and capacity building. It will encourage the uptake of innovative energy-efficiency technologies among a large number of users through the widespread dissemination of technical information and know-how. This will heighten the impact of technology transfer.

The four-year project will target five regions - Africa, Asia, the Caribbean, Latin America and the Pacific. These have been targeted for their significant number of Least Developed Countries (LDCs) and Small Island Developing States (SIDSs). https://www.imo.org/en/MediaCentre/PressBriefings/Pages/01-2016-MTCC-.aspx

8.6. Country Level Green Shipping Subsidies

8.6.1. EU Member States

NORWAY

Source: https://grontskipsfartsprogram.no/

The Norwegian government has stated that its ambition is for 30 % of goods transported over distances of more than 300 km to be transferred from road to rail and sea by 2030. According to the Norwegian Environment Agency, this could give an accumulated reduction in greenhouse gas emissions from the transport sector of about 1.5 million tonnes CO_2-eq over the period 2021–2030. This means that shifting freight from road to sea is a sound climate and environmental measure, even if it is a shift to ships using conventional technology.

In February 2017, the Government introduced a three-year pilot grant scheme to encourage a modal shift of freight from road to sea. The scheme will make maritime transport more competitive, and will at the same time have positive effects on the environment and climate, and will reduce congestion on the roads and improve safety.

The grant scheme has received a good market response. There have been two rounds of awards so far, in 2017 and 2018. These have resulted in five projects to establish new maritime transport services that are expected to give a permanent shift of transport from road to sea.

The Norwegian Government will:

- Initiate a dialogue with relevant industry partners to discuss the possibility of drawing up a letter of intent concerning green renewal of the cargo fleet
- Identify possible challenges relating to funding for green fleet renewal for the short sea cargo fleet with a view to improving the framework for this process
- Review the options available for green fleet renewal within the framework of currently existing funding instruments offered by the Norwegian Export Credit Guarantee Agency (GIEK), Export Credit Norway and Innovation Norway
- Take steps to realise the ambition of a shift in freight transport from road to rail and sea, and give priority to freight-related measures that will reduce greenhouse gas emissions
- Use incentive schemes for short sea shipping as a means of reducing total emissions from freight transport
- Whenever feasible, include requirements relating to zero-emission transport in public procurement processes

Source:

https://www.regjeringen.no/contentassets/2ccd2f4e14d44bc88c93ac4effe78b2f/the-governments-action-plan-for-green-shipping.pdf

Funding agency Enova

Enova's primary objective is to contribute to reductions in greenhouse gas emissions, improved security of energy supply, and the development of technology that will bring about reductions in greenhouse gas emissions in the longer term. Enova provides funding for investments in climate and energy projects in all sectors, and was allocated more than NOK 3 billion in the 2019 budget. The Ministry of Climate and Environment owns Enova, and it is largely managed through rolling

four-year agreements. The current agreement is for the period 2017–2020. From 2017, Enova's focus has been shifted more towards climate-related activities and innovation. This has meant a greater emphasis on reducing emissions from the transport sector and other non-ETS emissions, and on innovative solutions adapted to a low-emission society. The management model gives Enova enough flexibility to adapt its funding instruments on the basis of information on the development of specific technologies and markets. The rules on state aid determine which types of projects can be supported and how.

Enova is expected to give priority to projects that will play a part in reducing and eliminating barriers to new technologies and promoting permanent market change. In a low-emission society, energy-efficient and climate-friendly solutions should in the longer term be able succeed in the market without government support. Enova provides support to help

technology initiatives to make the transition from the pilot phase to market introduction, and also runs programmes to boost demand for energy and climate technology. Both approaches are intended to promote permanent market change.

https://www.regjeringen.no/contentassets/2ccd2f4e14d44bc88c93ac4effe78b2f/the-governments-action-plan-for-green-shipping.pdf

The Green Shipping Programme

GSP Service Office for fleet renewal will assist shipping companies in connection with specific, green construction projects. The service will be a practical measure that will help to realize the letter of intent on the renewal of cargo ships between the industry and the government.

GSP Service for shipping companies

Today's cargo fleet that serves the coast and short sea shipping is characterized by a high average age, old technology and thus large emissions of climate- and health-hazardous environmental gases. There is a great need for green fleet renewal. The shipping companies often lack the financial strength, technical competence and capacity required to carry out fleet renewal - especially since it is an unknown, new and green technology. This is the background for the GSP Service Office - an operational initiative that will help to realize and accelerate green renewal of the cargo ship fleet.

The purpose of the service office's services is to help shipping companies assess, specify and finance cost-effective newbuilding based on "need to have" and the lowest possible construction cost, but which nevertheless achieves maximum climate and environmental gas reduction.

The service office offers services to shipping companies from early phase assessments to contracts with shipyards being signed. The services are structured in two packages:

Package 1 - screening analysis . The service office will contribute with:

- Simple investment analysis of the company's potential newbuildings.
- Evaluate whether the project can be lifted financially.
- Examine support schemes; both private and public funding opportunities
- Summary of decision material, criteria and recommendations for continuation

Package 2 - investment analysis and design support . The service office will contribute with:

- Preparation of technical specifications / engineering support
- Collection of prices in connection with new construction (eg various propulsion systems)
- Assist in applying for both private and public support schemes
- Detailed investment analysis - support for technical / financial analysis
- Preparation of offers for announced green transport contracts
- Summary of decision material, criteria and recommendations for continuation

The price of the service must be at a level that makes the service office attractive to shipping companies - between free and low cost depending on the interest in the services. To speed up the program, package 1 will be guaranteed free of charge to the first five shipping companies, and for package 2 to the first two shipping companies . It is not the intention that the Service Office should deliver services that are in competition with well-established services that are delivered in the market today from e.g. ship designers, class companies or consultants. The purpose of the service deliveries is to fill a space where there are currently no established attractive services. The purpose is above all to speed up a green fleet renewal program where there will be positive climate, environmental and business effects for all players in the value chain.

Furthermore, it is important that the service office does not have a distortive effect on competition. Especially in connection with tender competitions, transparency is important, to ensure that all the offered shipping companies have the same information about what the Service Office can contribute. The service office shall offer competence development on equal terms.

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https://grontskipsfartsprogram.no/flatefornyelse/for-rederier/

GERMANY

Germany is a country that is very much oriented towards foreign trade. A strong and internationally competitive maritime sector is therefore of great importance for the entire economy as it drives Germany's competitiveness and helps safeguard growth and employment. The business community and policymakers seek to ensure that the maritime industry is structurally strong and that it can harness its full potential.

Estimates place the annual turnover at up to €50 billion and the number of jobs which are directly or indirectly dependent on the maritime industry at up to 400,000. This makes it one of the most important sectors of the German economy. The industry is characterised by its modern, high-tech shipbuilding and shipbuilding supply industries – many of which are well-positioned in the global markets –, its globally leading shipping companies – particularly container shipping companies –, its high-performance port and logistics industries, its innovative marine engineering industry, and its renowned maritime research and training facilities.

Despite difficult global market conditions, the maritime industry remains a key sector for the future of the German economy. It can help us find answers to the important questions of our time such as how we can transition to a sustainable energy supply, mitigate climate change, protect our environment, and ensure a secure supply of resources. Among the most important sectors of the maritime industry are maritime shipping, ports, shipbuilding, the shipbuilding supply industry, marine engineering, offshore wind energy and maritime research and development. The German government seeks to adopt an integrated policy approach that helps safeguard jobs, economic output and training and thus strengthen the German maritime industry as a whole.

Maritime Agenda 2025

Against this background, the Federal Cabinet approved the Maritime Agenda 2025 on 11 January 2017. This strategy, which was developed jointly by several different ministries, provides the Federal Government with a long-term framework that will make it possible to shape the future of the maritime industry in a targeted manner, and strengthen Germany's role as a maritime hub.

The Maritime Agenda 2025 sets out a wide range of measures to be deployed across nine fields of action of the maritime industry. The government also seeks to work with the business community to draw up a roadmap that describes the priorities of their applied research funding programmes and how the innovation capacity of SMEs – which form the backbone of the maritime industry – is to be strengthened. This is to help companies maintain technology leadership and tap new growth markets. Digitisation is another key focus of the Maritime Agenda 2025. High-speed broadband connections are to be expanded, not least in ports, and flagship projects (e.g. real-time services in navigation) provided with funding.

A special focus will also be placed on sustainability in maritime transport. Here, the Federal Government will provide targeted funding for green fuels and ship propulsion systems. The Maritime Agenda also calls for the development of international environmental standards as this will help to prevent distortions of competition within the industry.

The task of the Federal Government's maritime coordinator, who has been based in the Economic Affairs Ministry since 2000, is to coordinate all measures for strengthening Germany's competitiveness in the fields of shipbuilding, marine technology, offshore wind energy, shipping and ports.

In the run-up to the 10th National Maritime Conference, the Federal Government adopted its 5th report on the development and future prospects of Germany's maritime industry on 8 February 2017. The report describes the current situation in the maritime industry. It also provides an overview of the policies adopted by the Federal Government on maritime shipping and ports, shipbuilding and marine engineering, offshore wind power, and marine research.

https://www.bmwi.de/Redaktion/EN/Dossier/maritime-industry.html

Promoting sustainability in shipping

The Economic Affairs Ministry, the German Mechanical Engineering Industry Association (VDMA) and the German Shipbuilding and Ocean Industries Association presented their joint initiative for a maritime energy transition at the 10th National Maritime Conference. The aim is to provide more targeted funding for the development of technologies at the interface of energy, transport and industry, and to strengthen the dialogue of the maritime stakeholders. In spring 2017, the Economic Affairs Ministry announced the cross-programme funding initiative "Energy transition in transport", with total funding of €130 million. The focus is on aspects like sector coupling via electricity-based fuels, innovative maritime technologies in the field of offshore wind energy, and an efficient distributed supply of electricity and heat.

Source: https://www.bmwi.de/Redaktion/EN/Dossier/maritime-industry.html

THE NETHERLAND

A new partnership is being launched in the Netherlands designed to make inland shipping more sustainable. As part of the overall drive to reduce the emission of greenhouse gases from the shipping industry, Zero Emission Services (ZES) will offer a complete range of products and services, based on interchangeable battery packs charged with renewable power, charging stations, technical support, and an innovative payment model initially focus on the inland container shipping segment.

It is estimated that inland navigation contributes about 5 percent of the carbon dioxide (CO_2) emissions in the Netherlands while overall the Dutch transportation sector is responsible for 21 percent. Each container ship that switches from diesel fuel to ZES's battery power, known as ZES-Packs, can reduce its carbon emissions by 1,000 tons per year.

"The Netherlands is a front runner in sustainable transport by water," said Cora van Nieuwenhuizen, Minister of Infrastructure and Water Management. "Well over a third of all goods and 80 percent of bulk transportation takes place via inland waterways. Not only does this lessen truck transportation, which reduces traffic, inland vessels also emit significantly less CO_2."

Formed by The Port of Rotterdam Authority, financial giant ING bank, energy and technical service provider ENGIE, and maritime technology company Wärtsilä, ZES's goal is to transform diesel-powered inland shipping to fully electrically powered transport. Heineken will be the company's first customer, and by 2030, ZES expects that around 150 inland vessels will be powered by the new battery system.

"With ZES, we are introducing a systemic change in inland navigation, allowing barges to sail emission-free thanks to replaceable battery containers," said Willem Dedden, CEO of Zero Emission Services. "We will start out using batteries, but if hydrogen becomes cheaper in the future, hydrogen technology-equipped containers will be able to supply power in the same way."

The ZES-Packs will be charged with sustainably generated power and can be exchanged along a network of open access charging points. The ships will need to be equipped with an electric propulsion line, but to make the transition simpler for the shipping industry, ZES will use a 'pay per use'-based financing model where the shipper pays the cost of consumed energy and a battery container rental fee. ZES estimates that an inland vessel can travel 50 to 100 km on two charged ZES-Packs, depending on the currents and the vessel's size and draught.

To support the system, the first ZES charging station will be at Alphen aan de Rijn. They envision gradually expanding the network of charging stations to form a national grid of approximately 20 charge points. Vessels using the system will swap out the battery packs at charging points not losing time by continuing to sail with new packs instead of waiting for the batteries to be recharged.

The HEINEKEN beer company has entered into an agreement with ZES to become the first user of the new system. Fitted with ZES-Packs, the De Alphenaar will be the first ship to use the system to transport beer from the HEINEKEN brewery in Zoeterwoude via the inland shipping terminal Alpherium to the port of Moerdijk. Five additional vessels will also be fitted with ZES-Packs during 2021.

In addition to the support provided by ING, ENGIE, Wärtsilä, and the Port of Rotterdam Authority, the Dutch government is providing a grant from the Ministry of Infrastructure and Public Works and a grant from the Rijksdienst voor Ondernemend Nederland

supporting the goal of making transport more sustainable. The total cost is estimated at € 20 million for the first phase of the effort.

ZES plans to use this concept to move the entire inland navigation and short-sea sector toward emission-free sailing. Its longer-term goal is to set up an Amsterdam-Rotterdam-Antwerp corridor and making a connection to Nijmegen.

https://www.maritime-executive.com/article/dutch-to-make-inland-shipping-more-sustainable-with-battery-power

Dutch National Fund for Green Investments launched

The new Dutch National Fund for green investment initiatives has been officially launched. In fact, the fund represents a total value of €20 billion and goals to improve region's green infrastructure.

Source: https://safety4sea.com/dutch-national-fund-for-green-investments-launched/https://www.loyensloeffacademy.nl/media/477459/ship-finance-in-the-netherlands.pdf

SPAIN

The EU will allocate €27 million to the implementation of two projects in Spain through the Con-necting Europe Facility (CEF) mechanism, which promotes more sustainable and efficient transport. Specifically, the European Commission will support a number of initiatives, including the develop-ment of two new projects to supply LNG to ships bunkering in Barcelona and Algeciras, co-ordi-nated by Enagás.

The partners in these initiatives are Enagás, Scale Gas – a subsidiary created through Enagás Em-prende programme – Knutsen, the Port Authorities of Barcelona, and Bahíade Algeciras.

These projects are framed within the 'LNGhive2' institutional strategy lead by Puertos del Estado, to support the development of LNG market as maritime fuel and to guarantee its bunkering in the ports in compliance with EU Directive 94/2014 on alternative fuels.

Natural gas in decarbonising maritime transport

These new grants show how Europe acknowledges the role that natural gas, and in particular LNG, will play in the decarbonisation of the maritime sector. The funds granted by the CEF, which have been used to support a total of eight projects in Spain in the latest call, will help to achieve the climate objectives set out in the European Green Deal.

To reduce emissions from ships in ports, the EU gives priority to short sea-shipping projects using alternative fuels and to the installation of shore-side energy supply systems.

The initiatives proposed by 'LNGhive2' will further strengthen Spain's position as a European refer-ence in LNG bunkering. They follow the initiatives for small-scale supply and adaptation of infra-structure and logistics that are already underway under the 'CORE LNGas hive' project

The seven regasification plants in Spain are already adapted to supply LNG in transport, as are some ports, barges and tugboats, port cranes and trains.

Sustainable mobility

LNG is, today, after electric best option for progress in decarbonising maritime transport. It is a fuel that meets the standards of the International Maritime Organization (IMO), which in January 2020 set the limit on the sulfur content of fuel at 0.5%. Compared with traditional fuels, LNG eliminates 100%

of sulfur oxide (SO_X) emissions, between 80 - 90% of nitrogen oxide (NO_X) emissions, and between 20 - 30% of CO_2 emissions. The use of LNG as a marine fuel in Spain will reduce approximately 2 million t of CO_2 by 2030, which would be equivalent to the introduction of more than one million electric vehicles on the market.

Bunkering operations in Spain

Up to June 2020, bunkering operations in Spain increased threefold compared to the same period last year (89 operations in 2019 and 297 in 2020) and the volume of LNG supplied has almost doubled (38 663 m3 in 2019 and 62 837 m3 in 2020). According to the DNV/GL certifier, there are 169 LNG-powered ships operating in the world, 222 have been ordered and 126 are LNG ready. Furthermore, six of the 15 barges currently supplying LNG in the world have operated in Spain in recent years, reinforcing the country's role in supplying LNG to ships from trucks, ships or terminals.

This has been made possible by the development and progress of the 'CORE LNGas hive' and 'LNGhive2' public/private initiatives, co-financed by the European Commission. A total of 49 partners are taking part in these initiatives – 21 public (including 13 port authorities) and 28 private/industrial partners.

Source: The EU to allocate funds to LNG projects in Spain Published by Lydia Woellwarth, Deputy Editor LNG Industry, Monday, 03 August 2020 15:00

https://www.lngindustry.com/liquid-natural-gas/03082020/the-eu-to-allocate-funds-to-lng-projects-in-spain/

FINLAND

The 8th annual Nordic maritime B2B matchmaking event will be organized at the Finnish Ambassa-dor's Residence in Copenhagen on the 28th of April 2021. The event offers an excellent opportunity for Finnish maritime suppliers to establish new partnerships and high-level business relations with Danish ship owners.

The focus of the event will be on energy-efficient and green solutions, Smart Maritime technologies, including digital solutions, electric, connected and autonomous technologies for both newbuilding and retrofitting.

Mark the date in your calendar already now; the invitation with registration will be sent before the end of year 2020.

https://www.businessfinland.fi/en/whats-new/events/business-delegations/2021

For more than 70 years, Finnlines has played an essential role in integrating Finland with the rest of the Europe and Russia and increasing the prosperity in our country. With good seamanship and

long-term focus, the company has navigated through several economic storms during the years. In fact, thanks to these challenges, Finnlines is today in better shape than ever.

The current world crisis due to the Coronavirus pandemic has taken the world by surprise and challenged governments, societies and economies globally. Whilst ensuring the safety of its citizens, it is just as important to safeguard the supply of food, medicine and other consumer goods to each country. Finland's island-like location, and its dependence on sea transportation require frequent and regular liner traffic services. This is nothing new to Finnlines, being the most important player providing maritime transport of rubber-tyred vehicles, i.e. lorries and trailers to and from Finland. In fact, Finnlines alone transports more than one third of the roughly one million trucks moving over the three main sea bridges, Finland–Estonia, Finland–Sweden and Finland–Germany, which are connecting Finland to the rest of Europe.

One could ask why has Finnlines then remained so unknown for the citizens of Finland? The answer is quite simple. Whereas other commercial operators such as passenger car ferry operators mainly focus on recreational travel and spend tens of millions of euro on marketing their offerings, Finnlines, in turn, focuses on freight and travellers of necessity. The need for our services is not dependant on tax-free exemptions or entertainment on board but rather on the general economy and the integration of Finland's 5.5 million population with the rest of Europe. This makes our business more vital for the Finnish society, more stable but less known to the general public.

Finnlines has a fleet of 21 vessels, of which all vessels connecting Finland to rest of Europe sail under the Finnish flag. Finnlines vessels run and perform their duties as usual even in the exceptional situation we are facing now. Finnlines, as one of the Finland's largest sea freight operators, ensure there is enough sea freight capacity to prevent disruption to the flow of goods, and its routes and schedules are tailor-made for rubber-tyred vehicles.

A substantial number of rubber-tyred vehicles between Finland and Sweden is carried on Finnlines' Naantali–Långnäs–Kapellskär route. With close to 30 departures each week, Finnlines is the leading freight carrier with a market share of over 40% on this maritime bridge.

Between Finland and Germany, Finnlines' Helsinki–Travemünde route is a very good example of a tailor-made service. With punctual morning arrivals and early evening departures every day to and from Helsinki, it has manifested its position as Finland's most important rubber-tyred service when analysing Finland's export and import volumes. Around 40% of all rubber-tyred vehicles between Finland and Germany are carried on this route and it represents the only direct maritime service for passengers between Finland and Continental Europe. In addition, Finnlines' ro-ro services cover the Finnish ports of Uusikaupunki, Turku, Hanko, Helsinki and Kotka offering connections to other European ports.

"Finnlines has a vital role in transporting critical goods, such as medicine, food supplies and other consumer goods, which are essential for Finnish people and industry. Our services are specialised for freight and they play a key role in the smooth flow of supplies. For example, the current vessel operating between Finland and Sweden i.e. Naantali and Kapellskär, MS Finnswan, can carry a considerable amount of cargo – up to 200 trucks per voyage, equalling the combined rubber-tyred capacity of four passenger car ferries providing daily sailings between Turku and Stockholm" says

Tom Pippingsköld, CFO, Finnlines Plc.

The development of a pioneering company like Finnlines has been a long-term effort. During the past years, Finnlines has concentrated on strengthening its core business operations and developing environmentally friendly solutions for maritime traffic. Regular high frequency traffic between Finland and the rest of Europe will continue to be the foundation of Finnlines' operations as well as continued investments in sustainability.

EUR 500 million investment programme for ultra green vessels

Environmental responsibility is part of Finnlines' business strategy. Reducing fuel consumption and cutting harmful emissions have been one of the key elements of its strategy for a long time. Finnlines will reduce its CO_2 emissions by investing in energy efficiency and green technology and by reducing fuel consumption. On top of this, Finnlines is investing in new environmentally friendly vessels to cut emissions further.

The world's greenest ro-ro vessels are currently being built to accommodate sustainable development. These ultra green vessels will be built with the latest technology available to ensure the lowest CO2 emissions. For example, they will be equipped with lithium-ion battery systems that enables zero-emission operations in port. The first ro-ro vessel is expected to start operation as early as next year, and the other two in 2022.

In addition to this, Finnlines has also ordered two giant Superstar eco-efficient ro-pax vessels, which will pioneer in honouring green values. They are designed to provide maximum efficiency and the seamless transfer of cargo and passengers. Ultra green Superstar ro-pax vessels will lift the maritime bridge between Finland and Sweden to the next level, while keeping in mind the importance of a vital sea connections from Åland Islands to both mainland Finland and Sweden. The Superstar vessels – starting in traffic 2023 – will take up to 1,100 passengers, 200 cars and 250 trucks per voyage.

"The new vessels will help Finnlines strengthen its market-leading position in its core business – rubber-tyred cargo traffic – and increase its share of passenger traffic especially in the Finland–Sweden traffic. In addition, the environmental footprint of each carried passenger or truck on this bridge will reduce significantly from current level, being already the smallest footprint of all available options. The total investment is EUR 0.5 billion. It is one of the most significant investments recently published by Finnish companies and is a key part of the sustainability measures we are taking to achieve our long-term goals to renew the fleet further – younger ships bring higher environmental standards to grow together with our customers in a sustainable way," says Pippingsköld.

Finnlines is the most critical company in Finland from security of supply point of view

The National Emergency Supply Agency (NESA) in Finland is prepared to spend EUR 45 million on financial support to ensure the transport of vital cargo from Finland to Sweden, Baltic countries and Continental Europe. The state acts responsibly and proves that the national arrangements for the security of supply in Finland are agile and strong.

Finnlines welcomes this decision, especially because Finnlines is the key operator carrying around 34% of all rubber-tyred vehicles even when combining the number of vehicles carried on these three critical maritime connections into and out of Finland i.e. Finland–Sweden, Finland–Germany and Finland–Estonia. Finnlines is the market leader in rubber-tyred maritime traffic in the Baltic Sea area and provides regular high frequency traffic to both private and public sector, and for example, between Finland and Sweden, Finnlines provides its service in a way that is the most cost-efficient and, also with the lowest CO_2 emission per transported rubber-tyred vehicle.

The National Emergency Supply Agency has already granted financial support to four out of seven commercial operators securing the main maritime bridges for rubber-tyred vehicles. The first support actions taken by NESA where addressed to commercial passenger car ferry operators whose operations are not viable without revenue from recreational travellers. For more freight oriented operators, the threat of serious disturbances was less imminent. However, the corona crisis is having a strong impact in Finland's economy and the value added of the transport sector is estimated to fall by around 20%, to which Finnlines is also exposed to. After several weeks of negotiations and encouraged by NESA, Finnlines has also filed an application under this same emergency financial support programme.

Finnlines is still waiting for NESA's emergency financial support decision but feels confident in receiving support based on Finnlines' pivotal role in securing Finland's security of supply in this important rubber-tyred traffic. Companies that operate in the same sector and compete with each other should have uniform and equal opportunities to apply for and receive financial aid granted by the State and authorities. Non-discrimination and ensuring fair conditions of competition are the basic principles of EU State aid rules. The key goals are also included in the Temporary Framework for State aid measures to support the economy in the current Covid-19 outbreak published by the European Commission on 20 March 2020.

"Finnish public-private cooperation is exceptional from an international point of view. It is important that the National Emergency Supply Agency sees the value of the main maritime connections between Finland–Sweden, Finland–Germany and Finland–Estonia. Finnlines' fleet and services in itself ensure Finland's security of supply. We offer more than 170 departures each week, into and out of Finland, with a fleet of 21 ships. We intend to remain as dependable and as reliable as ever in this exceptional situation we are currently facing" says Pippingsköld.

MORE INFORMATION

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https://cyprusshippingnews.com/2020/06/01/finnlines-is-an-integral-part-of-finlands-security-of-supply-eur-500-million-investment-programme-for-ultra-green-vessels/

ITALY

Within the support activities in the field of Sustainable Transport and Alternative Fuels, the Italian National Hub has activated a local working group, composed of stakeholders in the field of LNG for maritime transport. The members of this group include business associations, policy makers, national development banks, research institutes, consulting companies and universities. Among them is Assocostieri, the association of Italian companies involved in energy (maritime) logistics and biofuels. It is one of the most pro-active members, having organized a survey among associated firms and collected seven project info-sheets about LNG bunkering facilities, some with re-gasification plants, which are looking for funding, financing, cross-border partnerships, etc..

With this aim, Assocostieri and the National Hub organised an info day on funding programmes and calls, including the Connecting Europe Facility, the EIB, national development banks and private equity funds. This took place on 5 March, immediately before the official lockdown in the country. The meeting allowed for online participation, so as to allow for people in the COVID-19 "red-zone" to participate.

Assocostieri Director General Dario Soria and Eng. Capaccioli introduced the work done thus far in the field and the project info-sheets obtained, to twelve private participants (7 of which joined remotely), two representatives of the Ministry of Transport and Infrastructure and the coordinator of Conferenza GNL, Diego Gavagnin, the first Italian initiative on the LNG related supply chain.

Italian National Hub then described the assistance activities, their ability to work with other Mediterranean partners, and went through a detailed presentation of the CEF Blending Facility call, the CEF MAP Reflow call, CEF II, EIB financing products – including the Green Shipping Guarantee Programme -and outcomes of ongoing talks with national development banks and private equity funds.

Basing themselves on the project info-sheets, the National Hub also prepared an assessment of access to CEF calls. Considering the preliminary availability of the Italian Ministry of Transport and Infrastructure to lead an LNG cross-border project, the next step is to match this availability with the most suitable project and to confirm the interest (already verbally expressed by many stakeholders)

of other countries' operators.

Similar initiatives will be undertaken with business associations of shipowners once lockdown measures due to the COVID-19 emergency are phased out, and it is expected that a gradual re-start of activity will allow companies to broaden their focus to include such topics, as concerns regarding their daily survival will diminish.

A next online meeting of the WestMED Technical Group for Sustainable Transport/Green Shipping will take place later in April. Promoting Sustainable Transport in the western Mediterranean

Source: National Hub gathers Italian stakeholders in a LNG working group, 8 April 2020/by Communication team, https://www.westmed-initiative.eu/lng-working-group-italy-march20/

SWEDEN

The strong decarbonisation commitment of Swedish ship-owners has translated into a range of innovative green vessel projects. Sweden is among the first countries with substantial uptake of LNG powered ships, ship-to-ship LNG bunkering ships, electric ships and methanol-powered ships.

Sweden is one of the first countries with electric ships. One of these is the ferry connection between Stockholm and Movitz, operated by Green City Ferries. The other recent example includes the ferry connection of HH Ferries Group between Helsingborg (Sweden) and Helsingor (Denmark), with two ships, the Tycho Braahe and the Aurora (Box 1). This project not only consisted in converting vessels into fully electric vessels, but also providing the charging infrastructure in the two ports. These ships have come into operation only very recently, so it is too early to assess their effectiveness. Other Swedish ship-owners, such as Stena, are also working on electric vessels, in particular for ferries over relatively small distances.

Exemptions of electricity tax for onshore power supply

Onshore power supply (OPS) in Sweden is exempted from the electricity tax that is applied for electricity uses that are not for business use, as it considers that ships using shore power does not constitute business use. These tax rates that should normally be paid are SEK 293 (EUR 33.94) per MWh or SEK 185 (EUR 21.43) per MWh in Northern Sweden. Instead, Swedish authorities apply SEK 50 (EUR 5.79) per MWh of electricity tax to shore-side electricity. So the reduction from the tax is about 98%. At the request of Sweden to provide an incentive for shipping companies to adapt ships and ports to develop shore power facilities, the European Union agreed to allow these exemptions on the grounds that it does not distort competition.

The Swedish authorities apply SEK 50 (EUR 5.79) per MWh of electricity tax to shore-side electricity. This tax rate is above the minimum rate of taxation for electricity as laid down in European Directive 2003/96/EC. Sweden will apply the reduced rate of electricity taxation to all supplies of

shore-side electricity of at least 380 V to vessels used for commercial shipping of at least 400 gross tonnage. The limit is considered appropriate by the Swedish authorities so as to ensure that the absolute majority of vessels used in international traffic and larger vessels used in national traffic will be covered by the proposed reduction.

Financial support

Swedish ship-owners are dependent on banks and other financial institutions for financing new ships. As green ships are in many cases more expensive than existing conventional ships, they need to be able to convince their financiers that they will be able to recover these additional costs. In the cases that were successful, determining elements were long-term commitments by charterers and additional financial support from the NOx Fund and European Union, which we will treat below. In cases where upfront guarantees were absent or partially absent, banks were sometimes willing to take on some additional risk based on long-term relations of trust built up between the ship-owners and the bank.

Various Swedish ship-owners have been able to finance their green ships thanks to the Norwegian NOx fund. The principle of the fund is that all ships operating in Norwegian waters pay a NOx tax related to the NOx emissions of the ship; part of these tax revenues are spent on innovative projects aimed at reducing NOx emissions from ships. Ship-owners and operators can apply for this financial support, also foreign owners that operate their ships in Norwegian waters. Various Swedish ship-owners indicated that approximately 80% of the additional costs of LNG ships related to equipment were covered by the NOx Fund. These ship-owners were generally very happy with the speed and light administrative touch of procedures. Various innovative green ship-projects in Sweden were also funded by EU funds, in particular the Connecting Europe Facility, related to the Trans-European Networks for Transport (TEN-T).

Swedish ship-owners could not draw on financial support from the public sector in Sweden. There are no instruments similar to the Norwegian NOx Fund. At the European level, ship-owners could use loan facilities from the European Investment Bank, but they hardly ever use these, as the procedures and requirements are considered too bothersome and outweigh the benefits.

Source: Decarbonizing Maritime 2018 - Transport - The Case of Sweden, https://www.itf-oecd.org/decarbonising-maritime-transport-sweden

8.7. Other Countries

8.7.1. The United Kingdom

In January 2019 the government published Maritime 2050, a strategic vision for the future of the maritime sector building on the earlier 2015 Maritime Growth Study, outlining ambitious recommen-dations to take the UK maritime industry into the second half of the 21st century.

Underpinning the Maritime 2050 strategy are 10 core strategic ambitions, covering a range of topics from competitiveness to technology. These include the intention that the UK'lead the way in taking action on clean maritime growth, enjoying economic benefits from being an early adopter or fast mover.'

- Building on this strategic ambition, Maritime 2050 sets a vision for clean maritime in the UK as follows: *In 2050, zero emission ships are commonplace globally. The UK has taken a proactive role in driving the transition to zero emission shipping in UK waters and is seen globally as a role model in this field, moving faster than other countries and faster than international standards. As a result, the UK has successfully captured a significant share of the economic, environmental and health benefits associated with this transition.*
- The Clean Maritime Plan is the Environment Route Map of Maritime 2050, setting out in more detail how Government sees the UK's transition to a future of zero emission shipping. It encompasses the maritime commitments within the Clean Air Strategy to ensure that the sector takes the steps necessary to protect human health and the environment from air quality pollutants. At the same time, it recognises the need for all countries to take action to address emissions of greenhouse gases, in line with the Paris Agreement and its tempera-ture goals. In 2018 the UK was a leading voice in the agreement of the Initial IMO Strategy on the Reduction of GHG from Ships ('the IMO GHG Strategy'). The Strategy commits the maritime sector globally to reducing emissions of GHGs from shipping by at least 50% by 2050 compared to 2008, while pursuing efforts to phase them out. While the UK continues to believe that global action is the most effective way to achieve these ambitions, it also recognises the role that national action can play in leading the transition to zero emission shipping. In this context, the Clean Maritime Plan represents the UK's National Action Plan on shipping emissions.
- But above all, the Clean Maritime Plan is about opportunity. For example, research com-missioned by the Government estimates that the economic benefits to the UK across 11 key maritime emission reduction options could reach $650- 890 million per year by the middle of the century. In line with the Government's vision for sustainable economic growth

as set out in the Clean Growth Strategy and Industrial Strategy, the Clean Maritime Plan seeks to support the innovation already present in British manufacturing, technology, fuel production and services, encouraging the translation of this expertise to the potential new clean maritime market.

- In order to realise the full potential of this clean growth opportunity a collaborative approach from industry and Government is vital. The Clean Maritime Plan has been developed in close partnership with the maritime industry. This has included an extensive programme of stakeholder engagement, including the establishment of a Clean Maritime Council, alongside workshops and ongoing dialogue. The Council is a strategic advisory body, bringing together leading figures from the maritime industry, academia and Government. The Clean Maritime Plan has also been informed by a programme of economic and technical research, available online.
- This process of consultation and research has indicated that we are on the cusp of a global transition to zero emission shipping. To reach significant reductions of greenhouse gases and air quality pollutants, energy efficiency technologies will not be sufficient. Low or zero-emission fuels and propulsion technologies will be necessary. Many other countries are demonstrating a keen interest in the development and implementation of such green shipping innovations and are moving swiftly to demonstrate leadership in this field. Maritime 2050 sets out the UK's ambition on this front, while the Clean Maritime Plan sets out a route map for domestic action to respond to this opportunity. It will help ensure that the UK builds on its unique maritime heritage to remain a world leading maritime economy.
- It is Government's intention to support a high level of ambition on emissions reduction, providing enough direction to give investment certainty while allowing industry the space to innovate. To assist in providing this certainty, and in line with the recommendations set out in Maritime 2050, we have set out Clean Maritime Plan Ambitions for the UK maritime sector. A significant increase in technology commercialisation and uptake will be necessary by 2025 and 2035 to make it possible to reach zero emission shipping by the latter half of the century. As such, ambitions are articulated for each of these dates, highlighting the expected direction of travel.
- These zero emissions shipping ambitions are intended to provide aspirational goals for the sector, not mandatory targets. They can only be achieved through collaboration between Government and industry, promoting the zero emission pathways that maximise the economic opportunities for the UK economy while also minimising costs for UK shipping.

In order to achieve this vision;

By 2025 UK Gov expects that:

i. All vessels operating in UK waters are maximising the use of energy efficiency options. All new vessels being ordered for use in UK waters are being designed with zero emission propulsion capability. Zero emission commercial vessels are in operation in UK waters.

ii. The UK is building clean maritime clusters focused on innovation and infrastructure associated with zero emission propulsion technologies, including bun-

kering of low or zero emission fuel.

By 2035:

iii. The UK has built a number of clean maritime clusters. These combine infrastructure and innovation for the use of zero emission propulsion technologies. Low or zero emission marine fuel bunkering options are readily available across the UK.

iv. The UK Ship Register is known as a global leader in clean shipping and the UK is home to a world-leading zero emissions maritime sector, with:
- a strong UK export industry
- cutting-edge research and development activities
- the global centre for investment, insurance and legal services related to clean maritime growth.

Source: https://www.gov.uk/government/speeches/clean-maritime-plan

8.7.2. DUBAI

DUBAI GREEN FUND

The Dubai Green Fund was launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to encourage investments in green projects and foster Dubai's position as a global hub for the green economy. The Fund is the first of its kind in the region[2].

The Dubai Green Fund , with the goal of transforming Dubai with the least carbon footprint, has already raised AED 2.4 billion through an agreement with National Bonds.

In 2015, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, launched Dubai Clean Energy Strategy 2050, aimed at reshaping the energy sector in the coming decades, with the goals of achieving 7% of Dubai's total power output from clean energy by 2020, 25% by 2030 and 75% by 2050. Ultimately, according to Sheikh Mohammed, the goal is for Dubai to "become the city with the least carbon footprint in the world by 2050"[3]

2 https://www.dgf.ae/chairman-s-message
3 https://thesustainabilist.ae/green-funding-for-reshaping-the-energy-sector/

First Abu Dhabi Bank ; as an example of best practice, where it financed US$10 billion for green businesses over the next several years, as well as its issuance of a US$587 million 5-year green bond in 2017[4]. https://www.bankfab.com/en-ae/cib

Oman Shipping Company, a member of ASYAD Group, and Standard Chartered Bank have announced the bank's first sustainable financing deal in the Middle East worth $35 million. The agreement covers two ultramax dry bulk vessels, the 63,500 dwt sisterships Jabal Al Mish and Jabal Shams, delivered by China's Zhoushan Changhong Shipyard respectively in August and September 2019.

This sustainable financing agreement is the first of its kind in Oman and a first for Standard Chartered Bank in the Middle East. The 8-year facility is linked to key sustainability targets in line with United Nations sustainable development goals and the credit margin under the facility will be adjusted based on Oman Shipping Company's progress against sustainable targets, said StanChart in a press release[5].

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https://brodies.com/insights/banking-and-finance/the-poseidon-principles-and-their-implications-in-ship-finance/

https://www.dgf.ae/

4 © Copyright Emirates News Agency (WAM) 2019. https://www.zawya.com/uae/en/business/story/UAE_urges_international_community_to_pursue_green_investment-WAM20191212110644799/
5 https://www.themaritimestandard.com/standard-chartered-signs-sustainability-based-finance-deal/

8.8. Private sector financing

8.8.1. Green shipping fund

(NEW! operational as of 1st Q of 2021)

Tighter lending requirement have made traditional sources of ship finance increasingly difficult to access, and shipping needs significant investment to accelerate its transition to a zero-emissions industry and fund the growing fleet capacity required to transport the world's goods.

The Green Shipping Fund is a €400 million private debt fund that provides shipowner loans for new and existing vessels or retrofits that comply with our ESG criteria and lower their emissions in order to meet the IMO's 2030 and 2050 goals and the EU Green Deal.

With an average investment of €15-€50 million, the Fund provides senior secured debt financing to short- and deep-sea vessel owners and operators located in Europe.

Our criteria for new or retrofitted green ships with measurable emission reduction include:

- Fuelled by low emission fuels including LNG, LPG, Methanol and Hydrogen
- Full Electric ships
- Hybrid Eco ships, electric propulsion combined with MGO or low emission fuels
- Fuelled by 100% alternative fuels, if measurable and enforceable

The Green Shipping Fund supports the United Nations Sustainable Development Goals, and specifically focuses on Affordable and Clean Energy (SDG 7) and Climate Action (SDG 13). PROW's ambition is to make zero emissions shipping a reality and become a viable long term alternative to the traditional banks in the maritime sector.

The Green Shipping Fund has launched in Q1 2021.

Contact to learn more about the Green Shipping Fund.

https://prow-capital.com/index.php/green-shipping-fund/

8.8.2. Green shipping token (Germany)

New ways in financing meet the right timing

German shipping company Vogemann has started a new way of financing, using blockchain-based Green Shipping Token to expand its fleet of bulk carriers.

https://splash247.com/vogemann-touts-new-blockchain-based-handy-green-deal/

Frankfurt, Hamburg 08. July 2020. Shipping company Vogemann issues the Green Ship Token – A blockchain based security. The securities prospectus was approved by the FMA (Financial Market

Authority) Liechtenstein. The total issue volume of the Green Deal is USD 50 million. Institutional and private investors can participate from USD 1,000. Further key figures below.

The investment will go towards the purchase of Green Dolphin ships – eco-friendly bulk carriers that transport bulk goods such as grain, fertilizers, coal, ores, minerals, and steel as well as forest products.

https://www.ive.one/newsroom/vogemann-finances-more-sustainable-ships-with-ive-ones-block-chain-technology

Vogemann data suggests that currently worldwide there are just two handy bulk carriers (up to 40,000 dwt), which meet the highest requirements for CO2 emissions. These requirements only apply to newbuildings that will be put into service from 2029. Both ships of the so-called Green Dolphin'class were built for Vogemann and were put in service in 2019.

The so-called Green Deal created by Vogemann comes with 8% interest plus profit sharing for investors.

Vogemann is the first company to issue a token on iVE.ONE, but several more tokens are coming soon. The platform guarantees compliance with regulators and maximum easy-of-use "If someone is familiar with online banking, they can also purchase digital securities without any blockchain knowledge." CEO Phong Dao said. The issue will run on the Ethereum blockchain. The issuance and investor platform www.greenshiptoken.com is based on Ive. One, which was specially developed by the Frankfurt-based FinTech Agora Innovation for issues of digital securities via blockchain solutions.

"We have always been open to new financing methods," said Markus Lange, managing partner of H. Vogemann Reederei. "A security token offering is the logical continuation of our financing strategy."

"The worldwide fleet of handy size bulkers is threatened with an extreme shortage as a large number of these ships are too old, too uneconomical and therefore no longer competitive," said Patrick Schütze, managing director of Neofin Hamburg G, which is overseeing Vogemann's digital securities issue. "The purchase prices are currently at a low level. By acting with foresight, Vogemann is opting for an anti-cyclical investment and the oldest merchant's motto in the world: the profit is in the purchase".

https://splash247.com/vogemann-touts-new-blockchain-based-handy-green-deal/

Risk note: Like any investment, the purchase of Green Ship Tokens is not only associated with yield opportunities, but also with the risk of loss, up to the total loss of the invested capital. The main risks associated with an investment in Green Ship Tokens can be found in the securities prospectus approved for publication by the Liechtenstein Financial Market Authority (FMA). Potential investors are strongly recommended to read the securities prospectus in its entirety before making an investment decision and, if necessary, to seek advice from qualified third parties on an investment in order to ensure a comprehensive understanding of the information contained in the securities

prospectus. The full securities prospectus is available for inspection and download at https://greenshiptoken.com.

https://www.neofin-hamburg.de/en/new-security-token-offering-sto-german-shipping-company-vogemann-issues-green-ship-token/

8.8.3. Sustainable Transport and Green Shipping

WestMED initiative's Technical Group on Sustainable Transport and Green Shipping

Through the establishment of a cooperation framework within the western Mediterranean sub-sea basin, the WestMED initiative's Technical Group on Sustainable Transport and Green Shipping aims to promote dialogue among key actors and contribute to the deployment of innovative solutions for clean maritime transport.

Following the conclusions of the Steering Committee of Rabat in October 2019, the WestMED Assistance Mechanism set up this Technical Group (TG) in order to address maritime transport environmental challenges and identify potential opportunities for its sustainable development, including funding and project development.

The TG became operational as of April 2020, and four meetings with relevant stakeholders have taken place since then, involving Port Authorities and Ministries for each WestMED country.

To support the discussions in each TG meeting, dedicated National Groups have been established in all concerned countries, with a larger group of national stakeholders being consulted under the coordination of the WestMED National Hubs.

A specific Action Plan including a number of potential project ideas is currently under preparation. In parallel, a review of the most suitable financing mechanisms to support such concept is undergoing.

https://www.westmed-initiative.eu/promoting-sustainable-transport-in-the-western-mediterranean/?lang=fr

9 OTHER USEFUL INFORMATION

GREEN SHIPPING FINANCE
www.zeetug.com

9 OTHER USEFUL INFORMATION

Journals

Fathom.World

Fathom.World aspires to be the place you can find the latest news about the transformation of the maritime and ocean industries. Our industries are subject to social, regulatory and economic pressures that are rapidly reshaping how business is undertaken. We focus on the changes and developments that influence shipping companies, their suppliers and partners. Our aim is to be impartial, fair and accurate in our reporting.

Our content consists of unique content for those needing to know the latest developments in creating a sustainable ocean and shipping space, and the stories of the people actively engaged in this transformation (from the ships' crews to the regulatory and lobby group figureheads).

We also reprint/republish industry press releases and statements without embellishment, but as a representative view of events in our industry, as seen from a company (or often its PR company's) perspective.

Fathom.World is part of Fathom Media, owned by Craig Eason, a former deep sea navigation officer and BBC journalist currently living in Stockholm, Sweden. He spends his time moderating industry events, meeting interesting people, indulging in photography, and generally keeping his finger on the pulse of change.

https://fathom.world/about/

FutureShip

FS offers efficiency analyses that make financial sense, even in difficult economic times. Our ECO-Patterns and ECO-Practices analyses bring quick-win operational performance benefits with minimal investment. Our ECO-Chances and ECO-Solutions services provide you with recommendations for, and detailed studies of, only those engineering analyses that offer maximum return on investment..

www.futureship.de

DNV GL

Driven by its purpose of safeguarding life, property and the environment, DNV GL enables organisations to advance the safety and sustainability of their business. DNV GL provides classification and technical assurance along with software and independent expert advisory services to the maritime, oil & gas and energy industries.

It also provides certification services to customers across a wide range of industries. Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, DNV GL empowers its customers' decisions and actions with trust and confidence. The company continuously invests in research and collaborative innovation to provide customers and society with operational and technological foresight. DNV GL, whose origins go back to 1864, operates globally in more than 100 countries with its 16,000 professionals dedicated to helping their customers make the world safer, smarter and greener.

DNV GL Strategic Research & Innovation

The objective of strategic research is through new knowledge and services to support DNV GL's overall strategy. Such research is carried out in selected areas that are believed to be of particular significance for DNV GL in the future. A Position Paper from DNV GL Strategic Research & Innovation is intended to highlight findings from our research programmes.

www.dnvgl.com

Contact DNVGL

https://www.dnvgl.com/maritime/contact/options.html

https://www.dnvgl.com/contact/index.html

Useful Sources:

https://ec.europa.eu/inea/sites/inea/files/cefpub/cef_transport_2020-corridor-report_maritime-mos_metadata.pdf

CEF Transport

The Connecting Europe Facility (CEF) for Transport is the funding instrument to realise European transport infrastructure policy. It aims at supporting investments in building new transport infrastructure in Europe or rehabilitating and upgrading the existing one.

TEN-T policy objectives foresee:

completion by 2030 of the Core Network, structured around nine multimodal Core Network Corridors.

completion by 2050 of the Comprehensive Network in order to facilitate accessibility to all European regions.

CEF Transport focuses on cross-border projects and projects aiming at removing bottlenecks or bridging missing links in various sections of the Core Network and on the Comprehensive Network (link), as well as for horizontal priorities such as traffic management systems.

CEF Transport also supports innovation in the transport system in order to improve the use of infrastructure, reduce the environmental impact of transport, enhance energy efficiency and increase safety.

The total budget for CEF Transport is €24.05 billion for the the period 2014-2020. INEA is responsible for implementing €23.7 of the CEF Transport budget in the forms of grants during the same period.

https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport

https://ec.europa.eu/inea/en/horizon-2020/h2020-transport/projects-by-field/394

https://ec.europa.eu/inea/en/horizon-2020

GREEN VEHICLES

The Innovation Fund is one of the world's largest funding for the demonstration of innovative low-carbon technologies. What will be funded?

The Innovation Fund focuses on highly innovative technologies and big flagship projects within Europe that can bring on significant emission reductions. It is about sharing the risk with project promoters to help with the demonstration of first-of-a-kind highly innovative projects.

It aims to finance a varied project pipeline achieving an optimal balance of a wide range of innovative technologies in all eligible sectors and Member States, Norway and Iceland.

At the same time, the projects need to be sufficiently mature in terms of planning, business model as well as financial and legal structure.

The f und supports cross-cutting projects on innovative low-carbon solutions that lead to emission reductions in multiple sectors, for example, through industrial symbiosis.

The Fund is also open to small-scale projects with total capital costs under €7.5 million.

Application process

There will be regular calls for proposals in the lifetime of the Innovation Fund.

Large-scale call

The application process has two stages:

expression of interest, with a first assessment on the project effectiveness, innovation and maturity level. Projects that meet only the first two criteria may qualify for project development assistance.

Full application, where projects are assessed on all the criteria, including scalability and cost efficiency.

Project proponents can apply by submitting their projects when there is an open call for proposals. Projects can apply via the EU Funding and Tenders portal.

The first call for proposals for large-scale projects closed on 29 October 2020. For more information, check the large-scale projects tab.

There will be regular calls for proposals in the lifetime of the Innovation Fund.

Small-scale call

The application process is simplified and has only one stage:

full application, where projects are assessed on all the selection criteria, as specified below.

Project proponents can apply by submitting their projects when there is an open call for proposals.

The first call for proposals for small-scale projects is open until 10 March 2021. Projects can apply via the EU Funding and Tenders portal.

https://ec.europa.eu/inea/en/innovation-fun

https://ec.europa.eu/inea/en/horizon-2020/green-vehicles

Transport & Environment, Europe's leading clean transport campaign group

Europe's leading clean transport campaign group, Transport & Environment's (T&E) vision is a zero-emission mobility system that is affordable and has minimal impacts on our health, climate and environment.

Since created 30 years ago, T&E has shaped some of Europe's most important environmental laws. We got the EU to set the world's most ambitious CO_2 standards for cars and trucks but also helped uncover the diesel-gate scandal; we campaigned successfully to end palm oil diesel; secured a global ban on dirty shipping fuels and the creation of the world's biggest carbon market for aviation - just to name a few.

Credibility is our key asset. We are a non-profit organisation and politically independent. We combine the power of robust, science-based evidence and a deep understanding of transport with memorable communications and impactful advocacy.

Our staff in Brussels, Rome, Madrid, Berlin, Warsaw and London collaborate with our 63 national member and supporter organisations in 24 countries across Europe. All together our members and supporters represent more than 3.5 million people.

We coordinate the International Coalition for Sustainable Aviation (ICSA), which has observer status at the International Civil Aviation Organisation (ICAO) and are members of the Clean Shipping Coalition (CSC), which has observer status at the International Maritime Organisation (IMO).

We hold a seat on the board of ECOS, and are members of the Green 10 group of European environmental NGOs, Agora Verkehrswende, the Platform for Electromobility, the Coalition for Energy Savings, the Renewable Grids Initiative and the Electrification Alliance.

https://www.transportenvironment.org/about-us

EU funded projects and results

TRIMIS projects database is a specialised collection of projects at European, national and international levels.

Research project database (CORDIS) is European Commission's primary portal for results of EU-funded waterborne transport research projects.

Project success stories (particularly successful EU-funded waterborne research projects) can be found:

- **Horizon Magazine**
  Latest news, interviews and features about thought-provoking science and innovative research projects funded by the EU.
- **Horizon 2020 dashboard**
  Access to real-time programme data with the ability to filter by country, region, theme and more
- **Horizon Results Platform**
  Platform where framework programme participants present their results for you to search, contact their owners, and form partnerships.
- **Scientific publications, tools and databases**
  Transport Research and Innovation Monitoring and Information System (TRIMIS) Dashboard where you can search for data on beneficiaries of H2020 funding for smart mobility and services
- **Scientific publications**
  Scientific publications produced by the European Commission (JRC)
- **Transport research tools and databases**
  The Commission's Joint Research Centre compiles databases and develops software and modelling tools. You can access transport related ones here.
- **EU publications portal**
  Online library of EU waterborne transport research publications
- **OpenAIRE**
  You can access all scientific publications from Horizon 2020 via OpenAIRE
- **EU Open Data Portal**
  Single point of access to open data produced by the EU institutions - all data free to use for commercial and non-commercial purposes

https://ec.europa.eu/info/research-and-innovation/researcharea/transport/waterborne-transport_en

EU FUNDED RESEARCH PROJECT FOR ELECTRIFIED SHIPS (Horizon 2020 Program)

A group of 13 partners from the entire value chain of ship electrification have launched '**Current Direct'**, a research project that aims, among other things, to reduce the cost of battery-electric propulsion systems in shipping and build an 'Energy as a Service' platform.

The three-year project is **funded by the European Commission** under the **Horizon 2020 program** with nearly 12 million euros and aims to reduce greenhouse gas emissions from maritime transport by up to 482,000 metric tons of CO_2 equivalents per year.

The partners specifically want to work on a lithium-ion cell designed for maritime applications. In doing so, they will rely on novel manufacturing techniques to achieve significant cost reductions compared to current market prices. Current Direct also aims to develop an interchangeable energy storage system for maritime transport shipping and provide a mechanism for energy companies, institutional investors and government stakeholders "to participate in the green transformation of the European merchant and passenger fleet," according to a press release.

The project involves Spear Power Systems, Blackstone Technology, Umicore, the University of Hasselt, Rhoé, Aviloo, Foreship, EDP CNET, Vrije Universiteit Brussel, VITO, Wärtsilä, Lloyd's Register and Kotug. The partners have set goals of halving the cost of today's battery-electric marine propulsion systems and driving rapid deployment of the technology. Plans also include an "Energy as a Service" platform and the development of new business models for shipyards and locally based entrepreneurs. The project results will be demonstrated in the port of Rotterdam.

June 2020 a Dutch consortium took up the cause of zero-emission inland shipping with its newly founded joint venture Zero Emission Services (ZES). The ZES business model involves leasing exchangeable battery containers, known as ZES packs, to shipping companies.

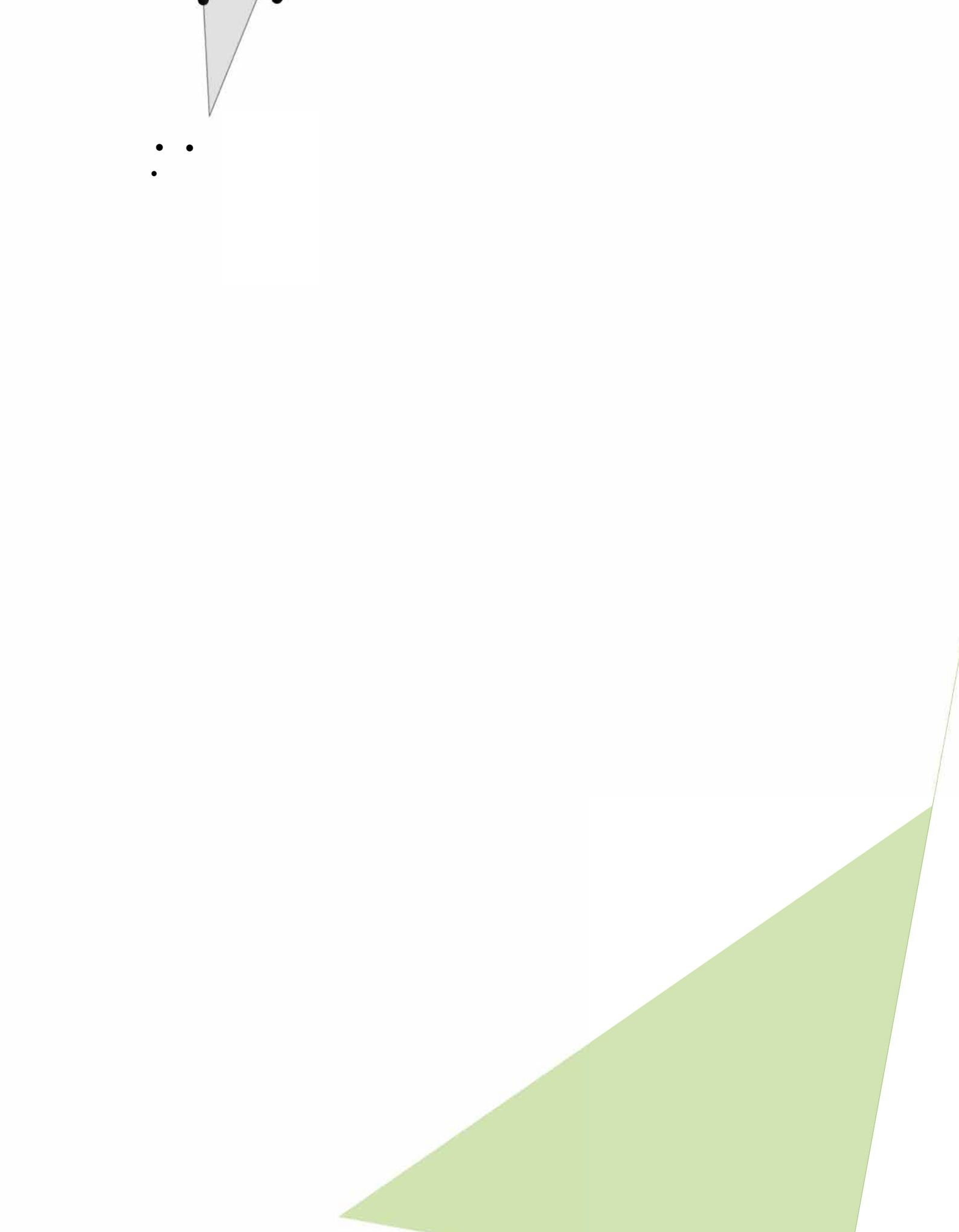
In September 202(, the European Parliament voted for the inclusion of CO2 emissions from maritime shipping in the EU Emissions Trading Scheme to decarbonise naval transport. The EU Parliament is currently in negotiations with the EU states on concrete legislation.

Maritime applications, and larger shipping routes in particular, are considered a hard-to-decarbonise sector owing to the long distances travelled. In November this year, for example, the Norwegian shipbuilder Havyard wants to complete the development of its announced fuel cell system for large ships next year and has now found its own company to market the system.

For ferries, both battery-electric systems and hydrogen systems are being developed. For example, in October this year, ABB Marine & Ports selected XALT Energy to supply battery systems to power two hybrid ferries for the British ferry company P&O, which are expected to operate regularly on the English Channel between Dover in the UK and Calais in France from 2023. For a larger ferry project, in December 2020, a group of companies applied to the European Union for funding to develop a large hydrogen ferry. The H2 ferry with the working title Europa Seaways is to have a fuel cell system with a capacity of up to 23 MW on board.

https://www.electrive.com/2021/01/05/research-project-for-electrified-ships-takes-off-in-the-eu/

Disclaimer: Information provided in this guidance document aims to help ZeeTUG clients to look for attractive Green Shipping loans and finance which requires further inquiries by the clients.



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