



THE DANAOS SHIP NEWS

A SEMI-ANNUAL EDITION OF DANAOS SHIPPING CO. LTD.

ISSUE #24, JANUARY 2023

The importance of technology in improving seafarer welfare



It is known that the transition towards digitalization and automation in the maritime industry is currently speeding up.

Digitalization refers to the use of digitized data and digital technologies to increase efficiency of existing processes or to enable or automate new processes. For example, tracking location data through satellite connection instead of using a compass is digitalization of the process.

One of the most advanced and well-developed technologies nowadays is sensor technology, which is quite popular in industries connected with transportation. Sensor technology replaces many of the manual tasks, like examining equipment aboard ships.

Connecting all machinery to sensors

helps mariners and ship technicians, while providing the managers with a continuous flow of data.

Additionally, digital services such as internet connectivity is adding up to seafarer's welfare and socialization. A Gallup survey in 2018 revealed that a connected workforce leads to a 17% increase in productivity, a 21% increase in profitability, and a 40% reduction in employee turnover.

At Danaos, driven by the necessity to monitor the vessels' performance and facilitate the onboard life of the crew, we had created our online vessel monitoring platform very early in the digital era. This way we acquired the advantage of easing our seafarers' daily tasks while everything onboard happened faster.

At the same time, we were able to take

well-informed decisions striving to performance excellence. Nowadays, the largest portion of our crew are already accustomed with the systems, which have been installed for more than a decade on our fleet vessels.

The excess amount of time that the ships' officers spend manually filling out paperwork and logbooks has been minimized and expected to get even lower in the future. From updating the charts and applications to manually updating crew lists for immigration purposes, most of the onboard procedures have been automated to reduce the workload stress that seafarers are put under each day and reduce the levels of human error.

The benefits of a digital fleet are clear. Though there is always a loss prevention expert ready to argue the opposite, a connected workforce should be happier and more motivated. At the business end, the opportunity to gather more data from the ship (without having to physically collect it themselves) provides crews with the visibility needed to build effective strategies for decarbonization. Of course, some seafarers find it difficult as now, they are not only obligated to upgrade their learning and education to include technology-based knowledge, but they must also retain the traditional skills and exhibit the personality traits necessary to succeed in jobs at sea.

It is the natural evolution of a world that is evolving and improving! After all, even the compass was seen as a new-fangled device when it was first introduced!

*Katerina Katsiada
Junior Data Analyst*



Message from the President & CEO

Dear Danaos Team,

A new Year has started with hopes that it will bring an end to the hostilities in Ukraine and around the world. This year was the best ever in Danaos history financially with the only caveat that it will almost never be repeated. The container industry in general experienced a phenomenal performance which already now is back to normal pre pandemic levels. The difference is that we are now much stronger and looking at the future with great confidence.

A very important development in 2022 was the introduction of two new nationalities in our crewing pools. The unfortunate war in Ukraine blocked a very large number of our seafarers and created a vacuum that we managed to fill with excellent Egyptian, Ghanaian and Filipino nationals. I remember that my father used to employ Egyptian seafarers back in the seventies so life is making cycles again. I would like to express my warm welcome to them in the Danaos family and hope that soon they will be familiar with the Danaos quality standards and run the vessels in a safe and economic mode. These new entrants will help us in the new growth phase of the company with the new deliveries.

This year also marks the entry into force of the new environmental legislation that puts a cap on the CO2 emissions of every vessel. These rules relate mainly to operational aspects of the vessel so the crew involvement in meeting them is very important and we hope you will assist our task.

With this I would like to express my sincere wishes for peace, health and happiness to all of you and your beloved ones.

With my best personal regards
John Coustas



Message from the Senior Vice President & COO

Dear employees and colleagues, onboard and ashore,
Dear Danaos Family members,

Significant changes have happened last year that have affected our lives and our business.

- The pandemic, with millions of human losses and a major distraction to our business seems to come gradually to an end.
- Geopolitical distractions threaten the world's order and fuel an energy crisis, creating strong inflationary pressures on the economy.
- The IMO is struggling to balance the differences between the desirable and the practically achievable means to regulate fuel emissions for the benefit of our future.

In other words, UNCERTAINTY is dominant in our lives.

However, one thing is certain. The strong position of our Company within the shipping industry where the brand name of Danaos promotes stability and sustainability for our future.

Within 2023 there are several issues that we, the management of Danaos, will focus on for the benefit of our shareholders, employees, business associates, and the environment.

- Human sustainability of our crews and employees.
- Decarbonisation of our fleet.
- Further development of our Environmental, Social and Governance footprint.
- Improvement of our cyber resilience.
- Increase our diversity culture ashore and at sea.
- Enhance our in-house training modules at sea and ashore.

With the above thoughts, I would like us all to focus on our continuous efforts to maintain Danaos a great Company that we can all be proud of.

Iraklis Prokopakis

Issue #24, H2/2022

Distributed free

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The newspaper is printed on recycled paper.

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Design: Simple Print - Lygnou Androniki, Graphic Arts - 13, Vrioulon str., Krioneri 145 68, Greece - mob. +30 6945 546936, e-mail: simpleprint.al@gmail.com

Amalia Coustas Obituary

Last August, Amalia Coustas, the beloved wife of our founder Dimitris Coustas and mother of our President John Coustas passed away. The first vessel of our company was named Amalia, as were two of our newbuildings in 1978 and 1984.

Amalia Coustas raised two children, John and Maria and was fortunate enough to have been blessed with many grandchildren. Throughout the difficult and trying times the shipping industry faced over the years, Amalia was a pillar of support to her husband Dimitris Coustas until his passing. During the last years of her life, she lived alone in her house in Agia Marina, always with a smile on her face and with the company of her grandchildren. We will always remember her and cherish the fact that we were fortunate enough to have her with us at Danaos' 50th Anniversary celebration, where she came to honour the history of our company.



COMPANY NEWS

to be continued to the next page



24th Marine Money Greek Ship Finance Forum

Dr. John Coustas on "Danaos: A 10 year rollercoaster" interview by Mark Friedman, Senior Managing Director of Evercore, analyses the financial progress of our company through a timeline on last years' challenges based on current trends and long-term environmental changes.

Visiting M/V ZIM Monaco

Danaos interns, accompanied by Capt. Nikos Polymeris, visited our lady M/V ZIM Monaco in Piraeus Container Terminal (PCT).

Capt. Polymeris took the interns around the vessel and spent the day exploring the engine room, the bridge and the deck while they got to meet our valuable seafarers.



First Aid Training

Being trained on the skills required to deal with emergency situations whenever and wherever they may occur is of vital importance!

We are happy to offer our people a comprehensive a CPR & First Aid course, designed to give them the confidence to act and manage an everyday injury or a more serious emergency.

Cause first aid training is saving lives!



Safety comes first!

A fire safety in-house training was successfully completed on our premises. The training was delivered by a designated firefighter from the Hellenic Fire Academy and it was especially designed to introduce us to the necessary skills of fire safety, prevention and risk assessment.

With safety coming first everyone should always be prepared and work with each other effectively!



Padeling Day

Danaos employees had such a fun day in the courts, while the 4 luckiest won a private padel course. Playing padel is great but playing padel together is so much better!!

We are already looking forward to participating in the next game!

Padeling together, Staying together!



Danaos Scholarships

Danaos traveled to the University of the Aegean in Chios and awarded scholarships to the most distinguished students of the year.

Congratulations to Mrs. Moumouri and Mrs. Lazou and we wish you all the best for your future endeavors!



Danaos and HELMEPA International Coastal Cleanup Campaign

On the occasion of the International Coastal Cleanup Campaign coordinated in Greece by HELMEPA, another voluntary coastal cleanup was successfully completed yesterday in Voula.

A big thank you to Danaos' employees and their families who renewed their commitment for the protection of our planet by taking part in this global initiative and spreading the message that we care about the sea and the future of our children.



Afforestation in Paiania

According to a Chinese proverb, the best time to plant a tree was 20 years ago. The second best time is today!

For a 2nd year, Danaos Shipping joins forces with We4All and we are grateful and honored to be part of this forward movement.

Thumbs up to the Danaos Treeplanting team and the invaluable help of the little ones!



Athens Classic Marathon

Runners from across the globe united in Greece for the 39th Athens Marathon retracing the steps of the Ancient Greek hero, Pheidippides, who ran from Marathon to Athens to convey the news of Greece's victory over the Persians in 490 BC.

Among them, as per every year, the Danaos Running Team was there supporting ELEPAP and highlighting its important social work.

Congratulations to everyone who ran the 5km, 10km and 42km races of this year's Marathon!

As Bill Bowerman once stated "The real purpose of running isn't to win a race. It's to test the limits of the human heart"!



Ironman 70.3

Well done Danaos Relay Teams for completing the Ironman 70.3 in Vouliagmeni!



Alma Zois - Greece Race for the Cure

Team Danaos walked and ran to support the NGO "Alma Zois", during "Greece Race for the Cure" and spread awareness and hope in the fight against breast cancer! Together we are stronger.



Danaos' Theatre Team is back on track!

Sitting at the base of the Acropolis in the Odeon of Herodes Atticus and watching one of the oldest surviving plays of Sophocles, Antigone, provided such a magical setting.

The story follows the decision of Antigone to properly bury the body of her brother going against the order of her uncle Creon, King of Thebes, placing her relationship with her brother above human laws.

A modern reinterpretation of the ancient Greek tragedy about family honor, a young woman's devotion to her departed brother and the complete devastation of Creon after the loss of his beloved son which proves that without wisdom no one can ever be truly happy.



Kids Theatre "The hot air balloon of peace"

During the Christmas holidays we spent a fantastic Sunday evening with our little ones at the theatre! We said no to war and we joined the hot air balloon in an effort to spread joy all over the world!

We listened to lots of music, we sang together with the kids and we reminded ourselves that peace is our duty!

At the end of the day, being at peace is the ultimate position of power!



Latest Amendments in the Maritime Labor Convention (MLC)

ARTICLE



During 5-13th of May 2022, PART II of the fourth meeting of the Special Tripartite Committee of the Maritime Labor Convention (MLC) took place in Geneva with more than 500 participants who voted for a few amendments and resolutions regarding the working and living conditions of the seafarers.

MLC (2006) is a convention adopted by the International Labor Organization (ILO) that aims at establishing a principle for seafarer's rights by setting some fundamental working and living standards. According to Naftika Chronika, the convention has been validated by approximately 100 countries who represent more than 90% of the fleet worldwide.

The need for these updates was brought to light by the recent war in Ukraine adding to the already existing pandemic problems that caused massive complications in crew changes, especially in Ukrainian ports. More specifically, the amendments voted for relate to the below matters:

- States should further facilitate the prompt repatriation of abandoned seafarers,
- States should provide medical care for seafarers in need of immediate assistance including disembarkation and access to medical facilities ashore and facilitate the repatriation of the remains of seafarers who

have died on board in their territory or on the high seas, into whose territorial waters the ship enters next,

- All deaths of seafarers should be recorded and reported annually to the ILO so the related data can be published,
- Good quality drinking water should be available free of charge for seafarers as well as food in respect of seafarers' religious requirements and cultural practices,
- Seafarers should be informed about their rights relating to the obligation of recruitment and placement services and about compensations for monetary losses occurring when these services fail,
- Shipowners should ensure that seafarers have appropriate social connectivity and States ought to provide internet access in their ports and at their associated anchorages, with charges, if any, being "reasonable in amount",
- Seafarers should have appropriately-sized personal protective equipment, in particular to suit the increasing number of women seafarers

In addition, the resolutions adopted were:

- Improvement of the financial security to protect abandoned seafarers, in which case the financial system should be able to cover four months of outstanding wages and other entitlements stated in the seafarers' employment agreements,
- Contractual redress for seafarers against shipowners in case the latter do not comply with the standards indicated by the MLC on ships with an MLC certificate,
- Addressing the issues of harassment and bullying, as well as sexual assault and sexual harassment

The above mentioned proposals, will have to be approved by the ILO during the next session of the ILO Conference in May and June 2022. Upon their approval, they should be valid by December 2024.

Stefania Petrousi
Legal & Insurance Intern

The Ukraine War and its Consequences on Shipping

ARTICLE

HISTORY OF WAR

On 24 February 2022, Russia invaded Ukraine. The geopolitical games between Russia and Ukraine caused Europe's largest refugee crisis since World War II, with around 6.7 million Ukrainians fleeing the country and a third of the population displaced. The invasion also caused global food shortages.

SHIPPING INDUSTRY CONSEQUENCES

One cannot deny that the shipping industry has been greatly affected by this course of events. Challenging conditions have been created for seafarers from both nations and several changes in the operational status of world's ports have been noticed, especially for ports in the area of the Black Sea suffering the "Pandemic" of war. Most of Ukraine's ports are closed or unreachable. Russian vessels were also banned from entering UK and EU ports, and have been detained due to suspected sanctions breaches: in February 2022, French warships detained Russian roll-on/roll-off cargo ship *Baltic Leader* en route to St Petersburg while more than a dozen Russian-owned superyachts have been seized. Sanctions against Russia are also going through the logistics and the supply chains and, thus, create concerns for the transport of good and commodities. Taking as an example the container sector, we can see that the conflict has affected it in two ways:

- a) It has resulted in higher oil prices
- b) It has led many countries to impose sanctions



on Russia to isolate the latter.

The increase in bunker prices will likely put further upward pressure on freight rates in an already historically high market.

According to CNBC, cargo movements are at a standstill as the Ukrainian ports of Odessa and Mariupol are closed, damaged or under attack. Specifically, the port of Odessa is Ukraine's largest and a major grain export port. It is worth noting Russia and Ukraine account for about 29% of the global wheat export market. Many of the containers that are stuck on docks have to undergo long processes and customs inspections in order to ensure that they are not carrying blacklisted items, such as spare airplane parts or semiconductors. According to Windward, it may have taken some time, but the U.S energy ban and the European Flag ban are coming into effect, causing great confusion for those out on the water.

The deterioration of the security situation in Ukrainian ports and anchorages, has led the

Ukrainian Maritime Administration to issued guidelines for hot and cold lay-up of vessels, such as the design of lay-up procedures, the factors to take into consideration when evaluating the safety of layup locations, considerations regarding manning, etc.

SEAFARERS CONSEQUENCES

According to Safety4Seas, together Russia and Ukraine account for nearly 15% of the world's 1,89 million seafarers. After spending several months being stuck at sea because of the COVID-19 pandemic, the current war in Ukraine is causing hundreds of thousands of seafarers once more to be stuck for an uncertain period of time; and this can have a major impact on the maritime transport.

Since the beginning of the conflict on February 24, three Panama-flagged ships have been hit by missiles in the Black Sea. Of these, one has sunk, while the other two remain in the area, having sustained damages. Luckily, no casualties of the crew were reported. The nearby ports are closed, and ships aren't leaving out of fear that they will be hit by missiles or underwater mines in the Black Sea. Unfortunately, in the first week of March, a seafarer was killed at the port of Oliva after the cargo vessel he was on was hit by a missile.

Theodoros Chatzigeorgiou
SQE Intern

Reducing the Risk of Fire on Board

ARTICLE

During the last years an increase in cargo fire incidents has been noted with over 70 cases of fires on container ships reported over the span of five years¹. Some of these with serious consequences costing lives, significant cargo losses and ship damage according to reports published by insurers and/or P&I Clubs. Every such incident that takes place onboard, gaining a lot of publicity, at the end is the result of numerous processes that have happened in the “background”. This “background” involves various intermediates who are responsible for the appropriate packaging, stowage, transportation, certification of the goods identified as dangerous but not limited to.

Investigations over time have pointed out a significant issue with mis- and undeclared hazardous cargo, such as chemicals and batteries, which are the cause of many significant incidents, both at sea and in storage facilities. This shifts the burden of the obligations and responsibilities to those who enter cargo into the supply chain, in general terms shippers and packers.

However, not only them but all parties involved starting from the sellers and buyers to warehouse operators, forwarders, logistics companies, cargo handlers and terminal operators have a duty of care of the transported dangerous goods. When it comes to sea transportation then compliance with the latest mandatorily applicable version of the IMDG Code is essential.

However, the ship and its crew face a great challenge against the hidden safety risks not only of dangerous goods (DGs) but also of cargoes that may not be characterized as dangerous by the IMDG Code still they represent a possible source of ignition when specific conditions are met. In the cases of declared dangerous goods when all foreseen formalities have been made as per the IMDG Code then the ship’s crew become aware of the special handling that is needed onboard and from the ship’s side they should seek full compliance with the regulations. Nonetheless, also in these cases the shipper has a duty “to warn the carrier of dangers posed by the cargo and [...] there is “nothing in the IMDG Code [stating] that a shipper may not provide additional information”². This is not the case however for the group of commodities which are not classified as dangerous but still pose a fire hazard.

So, from the moment such a container is loaded onboard what can the ship’s crew do to avoid a potentially “catastrophic” fire? The Crew has no control over the content of a container, but they can focus on emergency preparedness. Of course, when one must cope with



such difficult cargoes and in larger vessels the available means and human resources onboard maybe inadequate in some cases. This is the subject of an ongoing discussion within the industry. On the other hand, there have been cases where the effective emergency preparedness and highly professional response of the Master and the shipboard personnel to control the fire resulted in the minimum possible losses. Therefore, a well-trained crew with high safety awareness can make the difference.

Training, training, training...

At Danaos we always emphasize the importance of training both during ashore pre-joining meetings and our onboard attendances. Crew awareness should be enhanced for early detection since it proves critical to contain and extinguish a fire. So, proper care and good observation during the daily rounds on deck for any smoke, burning smells etc. should be carried out always with safety precautions in place. Masters & Chief Officers should adhere to the company’s Annual Drills Planning and in conjunction with Emergency Procedures Manual make additional drills -if they deem necessary- to ensure crew familiarity with the procedures and exercise preparedness. Moreover, they must ensure availability onboard of a piercing rod, sprinkler pipes, firefighting cannon, and readiness of firefighting equipment at all times. Last, the Company in order to strengthen firefighting capabilities of the ships decided to supply the whole fleet with two Portable Twin Hydrant Valve and one Container Fog Lance Kit which should be properly stored, well maintained and their use to be demonstrated during shipboard drills.

Vassiliki Giannakou
SQE Coordinator

¹ Allianz Global Corporate & Specialty (2022), “Safety & Shipping Review 2022”, <https://www.agcs.allianz.com/>

² UK P&I Club and TT Club (2022), “Book it right and pack it tight”, <https://www.ttclub.com/news-and-resources/publications/>

Developments in the Containership Industry

ARTICLE

The Covid-19 period could be described as a shock for the global economy with freight rates reaching low levels at the start of this pandemic. Yet, signs of reaching high levels for containerships appeared. However, the current affairs could affect them in a negative way having an impact on the overall profits. Some of them will be presented here including a suggested strategy of freight rate protection based on derivatives to avoid any losses on profits.

The year of 2021 could be described as a period of high freight rates which guaranteed massive profits for shipowners in the container sector. However, after March of 2022 this upward trend started to decline as congestion, Shanghai’s extended lockdown, the war in Ukraine, and inflation took place. Shanghai’s lockdown and the excessive demand for transportation caused cancelations of sailings and high congestion. To be more specific, congestion tied up as much as 10% of the fleet capacity for the past 18 months affecting the on-time deliveries not only in China but also around the US ports, leading to severe profit losses. Even if this problem could be characterized as



monetary and manageable, the outbreak of the Ukrainian war triggered concerns as energy and food prices as well as interest rates keep rising. As a result, consumers will most likely lower their spending, as they face higher prices, and, hence, demand will decline affecting the freight rates negatively for the liner shipping. To make matters worse, the US inflation is at its highest levels since the 1980s, which, combined with the fall of the S&P Global 1200 stock index, caused the corporate earnings to fall 10% since the beginning of 2022. All these explain why distress is building up of how the freight rates will evolve in the upcoming years.

A strategy that could offset the doubts of how

the freight rates will fluctuate is Freightos Baltic Daily Index (FBX), future contracts having a minimum contract size of 10 forty-foot equivalent units. Even though its ancestor the Shanghai Container Freight Index (SCFI) failed and was withdrawn in 2013, Zvi Schreiber, CEO of Freightos, appears optimistic as it has been tested thoroughly.

It could be an opportunity for the shipowners to hedge themselves to the upcoming risks as the freight rates might not recover and so they will offset the physical rate decline with a paper gain.

To conclude, it is generally accepted that the shipping industry and in turn the containership sector is quite volatile and it faces significant uncertainties. All the described factors point to a slower growth in the upcoming years, indicating that shipowners should take action to protect their profits. As a result, a hedging strategy, like freight derivatives should be forced to tackle the possibility of severe losses contributing to future corporate operational efficiency.

Konstantinos Bakalis
Internal Audit Intern

Ports have always served an important function for the transfer of goods. Before the Industrial Revolution, ports had functioned as trade centers and marketplaces that would develop into centers for cross-cultural exchange, social development and demographic settlement. In the 21st century, as ports merge with Big Data, Artificial Intelligence (AI) and Internet of Things (IoT), the port is beginning to be seen as an interconnected smart environment bringing together different port sectors and even other ports. A smart port equips the workforce with relevant skills and technology to solve the unique internal and external challenges of the organization, and to facilitate the efficient movement of goods, delivery of services and smooth flow of information. Using a holistic approach, the smart port achieves results without creating new challenges internally or elsewhere in the supply chain ecosystem. The whole supply chain is integrated while making autonomous, intelligent choices. To help build a network of highly connected and technologically advanced smart ports all over the world, the Hamburg Port Authority started the chainPORT initiative in collaboration with ports like, Montreal, Rotterdam, Barcelona, Felixstowe, Singapore and Busan, to share and disseminate the concept of smart ports. The maritime industry has been testing blockchain technology since 2017 and several shipping companies have partnered with tech companies to create blockchain shipping systems to improve maritime logistics. The smart port minimizes the negative impacts of its activities on the natural environment and enhances the surrounding communities -economically and socially. The material benefits of chosen technologies allow the smart port to:

- Improve efficiency to gain competitive advantage
- Increase business resilience to economic shocks or disruptive forces
- Extract maximum value from physical assets
- Develop new revenue streams based on digital value propositions
- Increase employee engagement and wellbeing
- Achieve and exceed environmental commitments

Moreover the Smart Digital Ports of the Future Conference is the only annual international event on the market that brings together the



largest number of global ports, terminals, and the entire supply chain to debate, share best practices, latest developments and to successfully propel the industry forward with digitalization. For the first time since 2019, Smart Digital Ports of the Future returned to a live, in-person event on 11th and 12th May 2022 in Rotterdam. The event was attended by the industry's leading innovators, and representatives from the world's smartest ports. This year's event showcased the technologies that are transforming the way ports do business - from discussions about standardization and data sharing, to technical case studies from the most advanced ports, on how they are unpacking the potential of emerging technologies such as AI, Digital Twin and IoT applications and many more. In 2023, Smart Digital Ports of the Future will return to Rotterdam even bigger and better. In conclusion, the shipping industry should adapt to the new challenges and at the same time invest in the development and improvement of the smart ports.

George Trivlidis
Crew Intern

External Audits

We are pleased to advise that the following vessels under our management have passed successfully 3rd-party ISM/ISPS audits for the period from 16 June 2022 till 19 December 2022:

Vessel	Port	Non-Conformity	Observation
BELITA	Marsaxlokk	NIL	NIL
COLOMBO	Tanjung Pelepas	NIL	NIL
DALIAN	Singapore	NIL	NIL
EXPRESS BERLIN	Gamcheon	NIL	NIL
HYUNDAI AMBITION	Pusan	NIL	NIL
HYUNDAI SMART	Norfolk	NIL	1
HYUNDAI SPEED	New York	NIL	1
ZIM LUANDA	Piraeus	NIL	NIL

The above findings have been evaluated in order proper corrective and preventive actions are decided to avoid recurrence.

At same time the following ships have undergone 3rd-party ISO 14001 and/or ISO50001* audit successfully:

Vessel	Port	Non-Conformity	Observation
HYUNDAI SMART*	Norfolk	NIL	NIL
HYUNDAI SPEED	New York	NIL	NIL

Thank you for your continuous support.

SQE Department

IMO’s highest priority is to contribute to the global fight against climate change and calls for immediate action to combat climate change and its consequences. Under the IMO’s pollution prevention convention (MARPOL), IMO has approved five necessary measures to minimize greenhouse gas emissions from international shipping: the Energy Efficiency Design Index (EEDI), the Energy Efficiency Existing Ship Index (EEXI), the Carbon Intensity Indicator (CII), the Ship Energy Efficiency Management Plan (SEEMP) and the Fuel Oil Consumption Data Collection System (DCS).

The initial GHG strategy envisions a reduction in the carbon intensity of international shipping. To achieve it, the maritime industry needs to reduce CO₂ emissions per transport work, as an average across international shipping, by at least 40% by 2030, with a goal of 70% by 2050, compared to 2008. The total annual GHG emissions from the maritime sector should be reduced by at least 50% by 2050, compared to 2008.

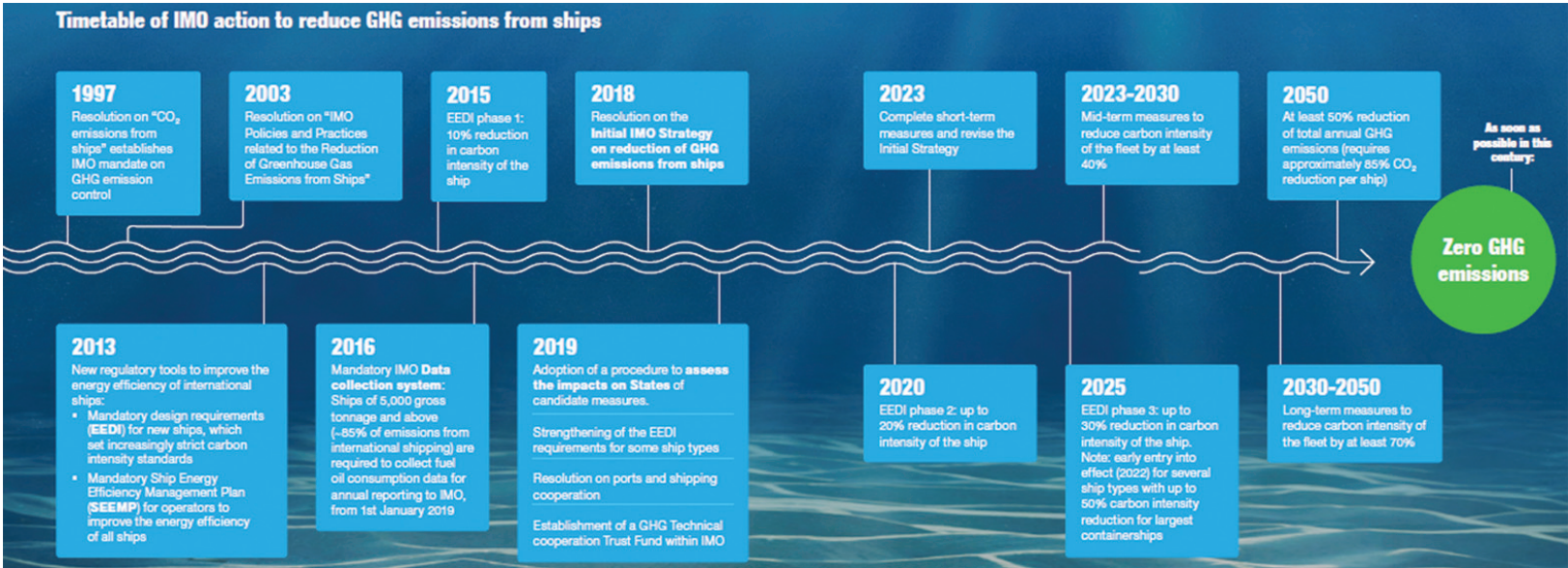
improving capacity utilization potential reduces CO₂ emissions up to 83%.

Power & Propulsion System: For reduction measures within the power and propulsion system, some studies report considerable emission reductions. However, the median estimated reduction for measures in power and propulsion system is relatively low. Hybrid electric auxiliary power and propulsion potential reduces CO₂ emissions up to 45%.

Alternative Fuels: Switching to LNG as a fuel can lead to relatively high emissions. Consisting mostly of methane, the CO₂ emissions during LNG combustion are considerably lower than those of other fossil fuels and this is reflected in the reduction potential. Biofuels potential reduce CO₂ emissions up to 83% and LNG up to 30%.

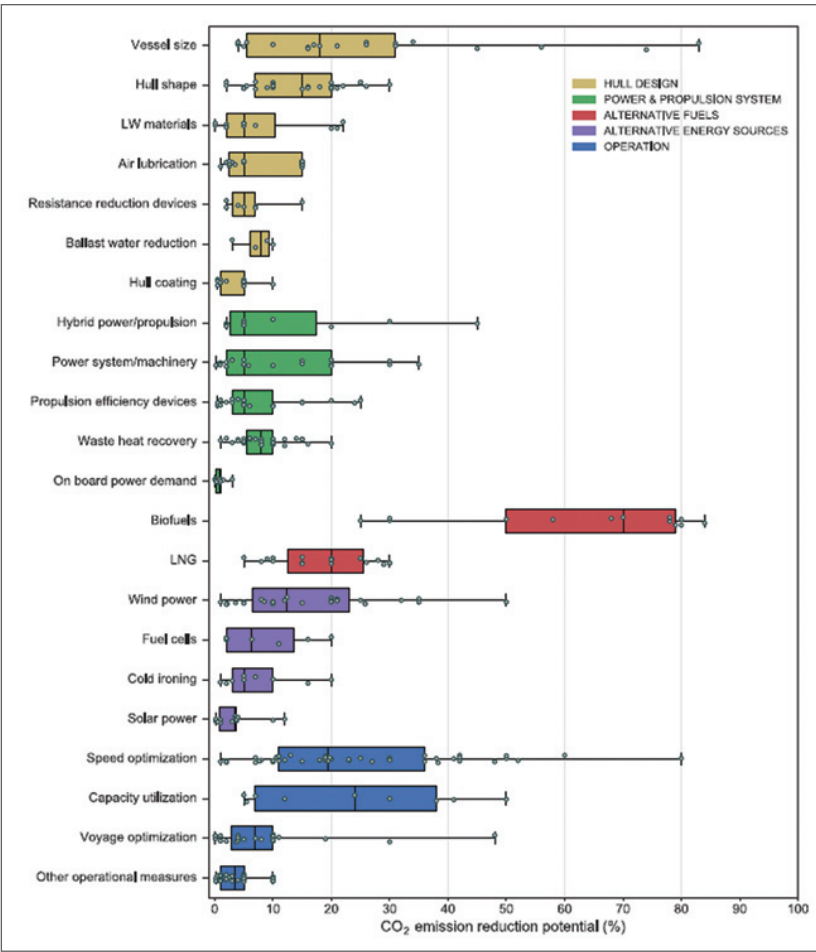
Alternative Energy Sources: For the measures focusing on alternative sources of energy we observe high reduction potentials for wind power and low potential for solar power.

The utilization of sails, kites, and photovoltaic cells to capture these



In April 2017, Evert A. Bouman published a paper reviewing over 150 studies to provide a comprehensive overview of the GHG emissions reduction potentials for maritime transport. Its aim was to identify the most promising areas, technologies and operational practices and quantify their combined mitigation potential. This paper reviewed the literature to identify measures with high CO₂ reduction potential and quantify the range of reported reduction potentials for 22 individual measures, as well as the maximum reduction potential identified by literature describing fleet-wide reduction scenarios. The potential reduction of CO₂ emission from individual measures, is classified in 5 main categories of measures:

Hull Design: Hull design measures focus primarily on utilizing economies of scale and reducing resistance during operation. The results indicate that novel hull design can contribute considerably to CO₂ emissions reduction. Increasing vessel size and



additional energy sources is strongly dependent on the ship case in which the technology is applied. Wind assisted propulsion potential reduces CO₂ emissions up to 84%.

Operation: As ship resistance is directly correlated with shipping speed, it is no surprise that speed optimization is another measure where relative high reductions in fuel consumption and emissions can be achieved. Voyage optimization potential reduces CO₂ emissions up to 60%.

In conclusion, based on the studies a significant emission reduction over 75% is achievable by swift adoption and combination of many individual dependent and independent measures. In other words, if the maritime industry focuses on the above categories it is possible to reduce GHG emissions with current technologies within 2050.

Georgios Pisimisis
Danaos Research Center Intern

Decarbonization of Maritime Transport

ARTICLE

The International Maritime Organization [IMO] has set a goal in reducing greenhouse gas emissions [GHG] in the maritime industry. To achieve this, a combination of design and operational indexes are applied. Although maritime transport constitutes 80% of international trade and contributes only 2.2% of GHG emissions, the IMO has committed to further reducing the industry's impact and visualizes full decarbonization by the end of the century.

The Marine Environmental Protection Committee [MEPC] which addresses environmental issues under IMO's remit including the control and prevention of ship-source pollution covered by the International Convention for the Prevention of Pollution from ships [MARPOL] treaty, during its 76th session, approved the 4th GHG Emission study. This study concluded that GHG emissions increased by 9.6% from 2012 to 2018 (977 mil. Tons in 2012 to 1076 mil tons in 2018), due to development of international trade. It is also worth mentioning that percentage of anthropogenic emissions accounting to maritime transport grew from 2.76% in 2012 to 2.89% in 2018.

To reduce carbon intensity of ships and tackle climate change, a series of actions is required. In order to transition into a greener future for shipping, the IMO has adopted short, before putting its finalized long term measures. The MEPC 76 has adopted amendments to MARPOL's Annex VI that will reduce GHG emissions. These amendments combine technical and operational approaches to improve energy efficiency of ships. The new measures will evaluate vessel's energy efficiency based on a predefined industry goal standard. Design efficiency will be evaluated by Energy Efficiency Design Index [EEDI], supplemented by Energy Efficiency Existing Ship Index [EEXI] and operational efficiency by Carbon Intensity Index [CII] and Energy Efficiency Operational Index [EEOI].

Design efficiency is assessed by EEDI, which is required for all newbuilding vessels and vessels undertaking extensive rebuild from 2013 onwards. This index reflects the ratio of cost to society, which in a vessels case is represented by its emissions, to the benefits, represented by its transport work. Regulation defines that attained EEDI should be lower than a required value. Thus a goal is set that depends on the vessels type and capacity. Attained EEDI is calculated based on maximum continuous rating [MCR] of main engine [M/E], deadweight, fuel type, speed and fuel oil consumption. The EEDI index accompanies a vessel through its lifetime. Verification is made during ship delivery, from the shipyard; by sea trials and International Energy Efficiency Certificate [IEEC] shall be issued by a competent authority.

EEXI similarly with EEDI defines vessels design efficiency. It is put into effect from January 2023 for all existing ships over 400 Gross Tonnage [GT] and verified during the first inspection after 01/01/2023. EEXI is calculated in similar manner with EEDI, but since it is referred to existing vessels, data like electrical generators [E/G] fuel oil consumption and reference speed might not be available. On this basis rules have been

developed for their calculation. After determining the attained EEXI it is compared with the required index. If the criteria are satisfied IEEC shall be issued, but in case of failure we have to make sure the vessel complies with the regulation. This can be achieved either by enhancing propeller wake flow, or by adjusting main engine (M/E) power output to a point lower than MCR. Since this modification of M/E is not permanent it can be set back to its original power output in case of emergency.

As previously mentioned, in addition to design, the IMO has developed operational measures for reducing GHG emissions of ships. In this context, vessels over 5000 GT are obligated to record fuel type and consumption in IMO's Data Collection System [DCS]. Further, vessels are forced to bring Ship Energy Efficiency Management Plan [SEEMP], where methodologies about collecting earlier mentioned data and procedures required to follow in order to report to the competent authority, are described.

EEOI index is not mandatory for a vessel, aiming to reflect the ratio of fuel consumption to its transport load. Through this, energy efficiency can be assessed for a specified timeframe. It is clarified that CO2 emissions for all fuel types, either vessel travels or is at bay, including ballast condition, are incorporated in the calculation. In contrast to this, mass of transferred cargo is referred only to loaded conditions. Further, distinction based on cargo type is defined.

The CII is a rating system, mandatory by IMO's MARPOL Annex VI, which comes into force in 2023. This measure will impact all vessels above 5000 GT engaged into international trade. The CII determines the annual reduction factor needed, to continuously improve the ship's operational carbon intensity, within a specific rating level, and reflects the ratio of CO2 emissions to deadweight transported distance. The actual annual operational CII will be documented and verified against the required CII. Finally, ships will get a rating of their energy efficiency (A, B, C, D, E - where A is the most efficient) based on this index. Rating of D and E are not desirable. In case of a vessel rated D for three consecutive years or E for one year, flag competent authorities, will require a corrective plan to be submitted towards improving its efficiency.

In conclusion, the IMO has set a goal into reducing emissions, by minimizing fuel consumption, through limiting M/E power output. As a result most efficient vessels can achieve higher speeds in contrast to least efficient. All existing ships will have to annually reduce their emissions through CII rating, establishing an unofficial slow steaming period. Orders of new building ships will rise due to the fact that existing vessels will be economically unviable, thus making design and construction of ships that utilize innovative technologies the only option for the maritime industry to transition into the decarbonization era.

Andreas Delidimitris
Technical Training Intern

The Philippines: The Largest Supplier of Seafarers

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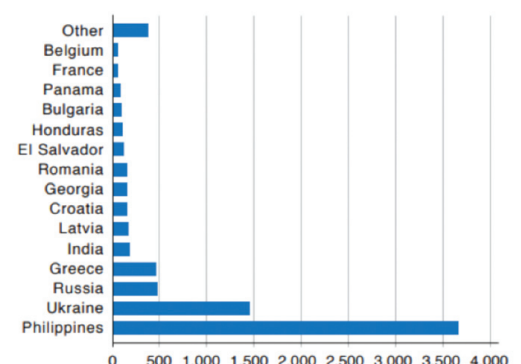
The Philippines are the single biggest nationality bloc in the shipping industry, therefore playing an important role in the supply of seafarers, which are the foundation of global logistics. In the 1970s, the number of seafarers in traditional seafaring countries decreased, resulting in the transfer of seafarer supply to countries such as India, China, and the Philippines. The Philippines have grown to become a major producer of maritime experts over the past 50 years and are considered by many to be the maritime capital of the world.

There are currently over 10.5 million Filipinos living and working abroad and they sent \$23 billion in remittances back to the Philippines in 2013. The shipping industry plays an important role in this: about 400,000 Filipino seafarers worked abroad in 2022, sending home more than \$ 2 billion in remittances.

The Maritime sector is very important for the Philippines, proven by how the country has changed its policies and laws concerning seafarer training, overseas employment support and legal protection while responding to the changes in the global seafarer labor market. The Day of the Filipino Seafarer is celebrated on June 25 every year in the Philippines.

Maria Mavromataki
Ticketing Operator

SEAFARERS' NATIONALITIES



SAFETY4SEA Crew Wellness Survey Report | Q4 2019



In light of the decline in local employment opportunities due to the collapse of national shipping, foreign employment has become the only option open to 22,000 trained Ghanaian seafarers currently registered in the country.

The employment situation of the Ghanaian seafarer today may not be promising, but the opportunities offered by globalization in shipping, especially the globalization of seafarers' employment are enormous. This offers hope, not only to the Ghanaian seafarer who has invested huge amounts of money to complete both their academic and professional education, but also to the nation as a whole for the preservation of maritime skills and know-how. The presence of a good training facility and the desire of Ghanaian school-leavers to work close to the sea are enough for encouraging and developing the seafaring profession.

Seafaring has been a source of employment for young Ghanaians for many years, partly due to its location as a coastal state and also

its encounter with major maritime nations in the last 200 years. During the early part of this century, Ghana, had shipping alliances with countries like Israel and Britain. This relationship offered to several Ghanaians the opportunity of serving on vessels belonging to these two nations and paved the way for them to train as seafarers of all categories.

Due to the presence of a maritime training facility, more school-leavers are still eager to be trained as seafarers. This occupation has always been associated with glamour and still does in spite of the challenges cadets have to go through, waiting for months or sometimes years for their turn to complete their service.

A study on making Ghanaian seafarers available to the international shipping community would be incomplete without a closer look at the areas of strengths & opportunities.

Strengths:

- High level of academic and professional training in accordance with STCW '95 requirements
- Proficient in English Language
- Hard working and confident
- Experienced in foreign employment
- Mix well with other nationals on board

Opportunities:

- Ready markets in the Middle East, and some Far Eastern countries such as Hong Kong, Singapore and Malaysia.
- Sought after by most previous employers.

There are currently about 22,000 Ghanaian seafarers out of which approximately 14%, about 3,250, are officers of all categories. Pre-sea cadets who are about 0.8% of the total are not included because they are not ready for employment. At the total of 55 number of officers 1,117 (34%) are employed and the rest are available for employment. Though there are no accurate figures for the employment of trained ratings who make up 85.2% of the total number of seafarers registered in Ghana, a similar percentage as the officers are employed on ocean-going vessels. Most of the remaining are employed either on fishing vessels registered locally or in neighboring countries. Also, there is currently about 66% of Ghanaian seafarers who are unemployed although they are well trained and available. Ghanaian seafarers may not be known on the international scene as a major labor source, but those who have had an opportunity to work with them they finally admire them. This is an advantage which must not be allowed to go unexplored.

*Argyro Papageorgiou
HR & Training Assistant*

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- <https://commons.wmu.se>



Issues you may want to report through the Ethics & Compliance Reporting (Whistleblowing) link (<https://ethics.danaos.com/>):

- Fraud/theft
- Waste and/or misuse of Company's resources

- Conflict of interest
- Financial and/or operational policies violations
- Non-compliance to applicable laws and regulations
- Any unethical business conduct

Key characteristics of the Whistleblowing link:

- Online reporting at Whistleblowing link
- Discrete and confidential treatment of concerns (to the extent possible under applicable laws).
- Employees may choose anonymity or provide their names and contact information.

Any employee who brings an issue to the Company's attention, through either the Whistleblowing link or the Internal Auditor & Compliance Officer, should be aware that Company's policy prohibits retaliation, discrimination or other adverse action, including dismissal, to be taken against an employee who -in good faith- raises or helps to resolve an ethical concern.

FREQUENTLY ASKED QUESTIONS

Q: What happens when I make an online report to the Whistleblowing link?

A: We review all Whistleblowing submissions and assess each one before deciding how to proceed. Submissions can be made anonymously. However, if you opt to tell us your name and how to reach you, it can help us follow up on the complaint, and inform you about the conclusions.

Q: Where can I find more information?

A: For more information please visit:
<https://www.danaos.com/investors/corporate-governance/corporate-governance-guidelines/default.aspx>

Q: Who can report issues/concerns to the Whistleblowing link?

A: Anyone can report fraud, conflict of interest, financial/operational policy violations, unethical business conduct, etc., to the Whistleblowing link.

Q: How do I start a Whistleblowing report?

A: Report a concern using the Whistleblowing link. Alternatively, you may contact either by e-mail (internal.audit@danaos.com) or by phone (+302104196483) the Internal Auditor & Compliance Officer to raise any issue, discuss any concern or seek for any advice.

We need you!

Please feel free to send us new ideas as well as articles and photos you might find interesting.

Mail to: hr@danaos.com, with subject: "For the Danship News."

With our Warmest Wishes for
Good Health and Happiness in the New Year

Season's Greetings



danaos



ΕΛΕΠΑΠ

Danaos has once again joined forces with ELEPAP
to protect and rehabilitate disabled children.