ANNUAL ENVIRONMENTAL REPORT 2018

danans

AT DANAOS SHIPPING WE SEEK TO PROVIDE SAFE, EFFICIENT AND COST-EFFECTIVE SEABORNE CONTAINER TRANSPORTATION AND REMAIN THE PREMIER CHOICE OF CONTAINERSHIP OWNERS. TO MEET THIS GOAL, WE CONTINUOUSLY MAKE SUBSTANTIAL INVESTMENTS IN OPERATIONAL, TECHNICAL AND FINANCIAL INFRASTRUCTURE WHILE STRIVING FOR ENVIRONMENTALLY FRIENDLY SOLUTIONS.

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Dear Fellow Stakeholders,

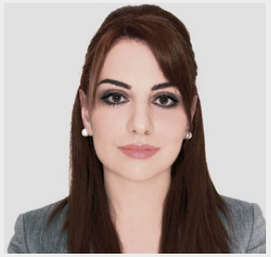
Shipping is by nature an industry which is influenced by geopolitics, global economy and regulatory developments but continually adapts to any circumstance. During 2018, the general trend in the shipping industry was for major players to join forces, creating an unprecedented consolidation, forging alliances and taking control over supply as a means of survival. The digitization of the industry, offering a bigger supply chain, while visibility and interaction is the new reality. Block-chain readiness, is a necessity not an option, in order for tonnage providers to be in a position to address their customers' needs for transparency, immediacy and quick response.

Danaos embraces the concept of fully digitizing its processes and operations via its state-of the- art WAVES architecture and aims towards the company's transformation as a "Block Chain Ready" partner.

From a regulatory perspective, while the ballast water treatment installations have been initiated and follow a smooth and pragmatic implementation schedule, currently the most crucial aspect is the preparation for the smooth transition onto the IMO 2020 low sulphur fuels, especially to blends of different fuels, which raise several considerations that have to be addressed effectively to ensure safe operation and flexibility. The investment in scrubbers is another topic that requires prompt and thorough technical-economic investigation, prior to any decision making.

Respectfully

Dimitrios Vastarouchas
Deputy Chief Operating Officer
and Technical Director



Dear Fellow Stakeholders,

The R&D department's main areas of focus for 2018 were:

a. scrubbers,

b. WAVES,

c. regulatory developments and related projects.

More than twenty-two scrubber systems have been reviewed by the R&D department, in order to conclude on the system that would be installed onboard several of Danaos' vessels.

Concerning the BWTS project, the final maker's selection for all vessels undergoing BWTS installations within 2019 was concluded. The R&D department was engaged in both the engineering work, as well as, the plan approval process of all related drawings.

The development of WAVES is an ongoing process, and within 2019 various routines have been realized, while the new field that we have been working on is "block chain readiness". Moving our architecture towards data sharing, our system is designed to provide strict and formal APIs for enabling third-party stakeholders, to have automated access to our data in a formal, real-time, secure, efficient and controlled manner, while eliminating compliance issues, duplication of effort, data losses and long processing times.

For 2019 the main area of focus shall be the proper fleet preparation for complying with IMO 2020 SOx emission limits.

Respectfully

Evi Politi
R&D Manager

"Our system is designed to provide strict and formal APIs for enabling third-party stakeholders, to have automated access to our data in a formal, real-time, secure, efficient and controlled manner.

DANAOS SHIPPING CO. LTD

GENERAL

Danaos Shipping Co. Ltd (DAS) is the exclusive Manager of Danaos Corporation (DAC).

DAC is a leading international owner of container ships who deploys its containership fleet principally under multi year charters with major liner companies that operate regularly scheduled routes between large commercial ports. As of February 28, 2019, we have charters with CMA CGM, Yang Ming, COSCO, Hyundai Merchant Marine, ZIM Integrated Shipping Services, Hapag Lloyd, Maersk, Evergreen, MSC, ONE and Samudera. Gemini has chartered two of its containerships to MSC, one to TS Lines and one to Hapag Lloyd.

OFFICES

Our head offices are located in Cyprus (Limassol), with Branch Offices in Greece (Piraeus), Ukraine (Odessa and Mariupol), Russia (St Petersburg), Tanzania (Zanzibar) and South Korea (Pusan).

OUR VALUES

Our values comprise of implementing the highest standards of efficiency, safety, and reliability by:

- Enhancing the training of our personnel ashore and on-board.
- Integrating fully the vessels in the organization.
- Actively participate and head research projects in efficiency.
- Promoting company culture and bonding on all personnel on board.
- Seeking growth by our strong comparative advantages to becoming the leader in our sector.

OUR R&D DEPARTMENT

Our R&D department falls under the Technical department of DAS and was officially established in 2011.

Our goal is to be in the forefront of innovation, brainstorming ideas and developing our knowledge and competences in order to address our clients' needs, in the changing and evolving maritime environment. We apply the company's know-how and technical expertise in order to improve our fleet's fuel efficiency and our environmental performance thus, maintaining our competitive advantage and leadership position in the shipping industry.

R&D department:

- Studies a great number of energy efficiency improvement measures and innovative vessel retrofit solutions that improve fuel efficiency and/or operational flexibility. This includes, among others, engine derating, propeller retrofit, bulbous bow optimization, PIDs, engine tuning for SFOC improvement, advanced painting schemes application, container stowage optimization, etc.
- Works on deeply understanding and assessing the real benefit -efficiency and cost - of emerging technologies on energy saving and emissions reduction, including LNG for propulsion, SCR for NO_X reduction, SO_Xscrubbers, etc.
- Performs feasibility and technical economic studies to assess systems from all related aspects -technical, safety, economical- and propose equipment and modifications required for regulatory compliance e.g. BWTS, ECA, etc.
- Collaborates with academic and industrial partners to develop knowledge and become prepared for future developments.
- Is engaged in Computational Fluid Dynamics (CFD) studies and model tests with major research institutes and ship model basins to identify the effect of various operational parameters or design aspects on vessels' performance. For example, hull roughness, trim, and weather effect. We are looking to verify, on a test scale, the effectiveness of various energy efficiency retrofit options examined.
- Places focus on ensuring the efficient and successful installation, as well as the stable and reliable operation of the online data acquisition and process system on board company vessels.
  Is engaged in the design and development of a business intelligence and analytics platform in cooperation with DMC (Danaos Management Consultants, our affiliate software company). This aggregates and analyses almost real-time received data through the online data acquisition and process system to produce advanced performance assessment, energy efficiency, and operational control tools with inborn diagnosis functions. The design of all built-in algorithms and performance assessment models is the essence of our accumulated knowledge and expertise
- Is responsible for producing the Danaos Annual Environmental Report that summarizes, among other things, the company's environmental performance. At the same time, it monitors and evaluates the fleet's annual energy efficiency goals and sets the new targets for the year to come.
- Drives the design and implementation of energy management systems and practices like ISO 50001 and the Ship Energy Efficiency Management Plan (SEEMP).

2018 REVIEW

In 2018 the key areas of focus were:

01 **SCRUBBERS**: Twenty-two scrubber systems were reviewed and a feasibility study was carried out, taking into consideration various technical and commercial criteria. The feasibility study aided our review, allowing us to conclude to a specific scrubber maker. The selected scrubber, will be installed onboard the pilot vessel LEO C, within Q1/2019-where based on its successful performance, the investment will be extended to another 10 Danaos vessels. Within 2018, the plan approval and class approval phase, was accomplished successfully.

02 **WAVES**: New routines were launched (i.e. fuel mixing BCS Profiling, Hull Cleaning timeline, MRV-as per DNVGL requirements & combined with Map, in order to indicate all MRV Related voyages-, Performance graphs application). The new interactive "MAP" application, was redesigned to incorporate multiple functions. A new alert, the Charter Party violation alert was introduced, informing the relevant stakeholders about the vessel's possible underperformance, in case Charter Party conditions are not being met. The foundation, for the digitalization of all company processes has been established, having fine-tuned the Seafarers Evaluation Application (SEA), as well as, the incorporation of the technical SI report and lubricants plan in the Danaos Analytics Platform.

03 **UPCOMING REGULATIONS**: As of 11/2018 SEEMP Part II plans have been approved and relevant Certificates of Compliance have been issued and sent on-board all company vessels. Concerning MRV, all MRV reports have been uploaded to the DVNGL platform for review and verification. In connection to the BWTS project within Q1/2018, the final maker's selection for all vessels undergoing BWTS installations within 2019 was concluded. The preparation and submission, of all related drawings, to both the maker and classification societies, for approval of BWTS retrofit onboard was also done. The engineering work was exclusively done by Danaos and the approval process was successfully accomplished for the Express Black Sea, Suez Canal and ANL Tongala. Within Q4/2018, the first successful installation and commissioning was completed the Danaos 3400 Teu vessel, Express Black Sea.

REGULATORY UPDATE

The shipping industry experienced several trends and challenges in 2018, owing to the plethora of forthcoming regulations associated with environment, certification and safety at sea. The effort to improve the environmental performance and reduce the carbon footprint in maritime transport, is a primary topic on the international agenda. In April 2018, the IMO adopted the "so called" Initial Strategy which aims, among others, to reduce greenhouse gas emissions by at least 50% by 2050 vis-a-vis 2008 levels. Reducing vessel energy consumption has, become a top priority for Shipowners globally and will see a further decrease on ship speed, in order to reduce fuel consumption and carbon emissions. The emissions control requirements and regulations are becoming stricter on a domestic level, with China's increasing concern, imposing a new decree for the re-adjustment of Domestic Emission Control Areas from 1st January 2019.

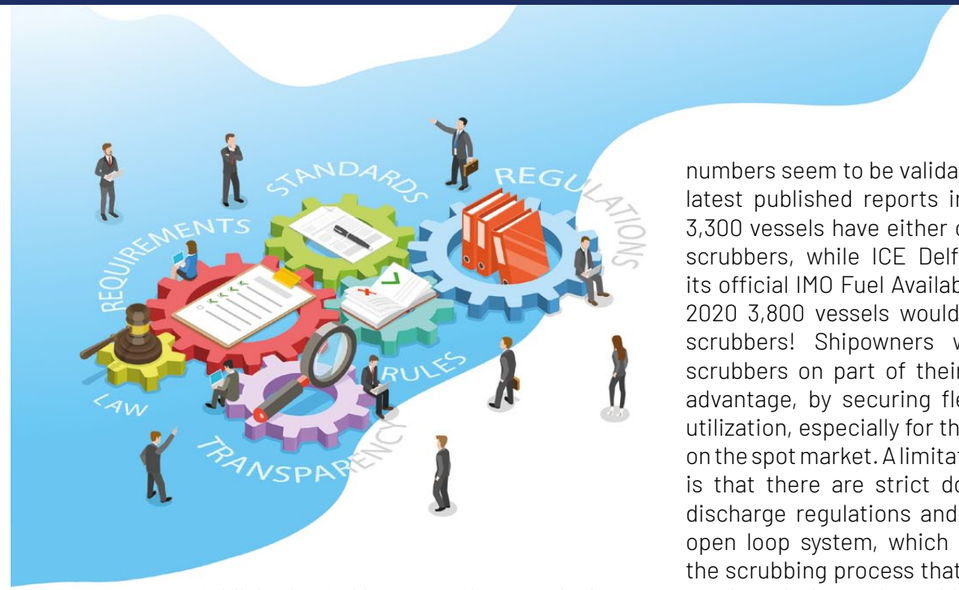
Climate change remains the driving force behind Energy efficiency regulations

Climate change remains the driving force behind Energy efficiency regulations. The EU MRV regulation for the monitoring, reporting and verification of CO_2 emissions for all vessels above 5,000 GT sailing in European ports, entered into force on 1st July 2015, with the Monitoring Plans submission in 2017 and 2018 being the first year of reporting.

Additionally, the IMO Data Collection System (DCS) and SEEMP Part II, is a new requirement added to chapter 4 of MARPOL Annex VI, titled Regulation 22A, which entered into force on 1st March 2018, with 2019 being the first monitoring period, requiring all ships of 5,000 GRT to submit to their Administration, annual reports on fuel oil consumption. The SEEMP Part II must describe the methodology that will be used to collect the data and the processes that will be used to report the data to the ship's Administration. The IMO DCS differs in several aspects from the EU MRV, including the confidentiality of data, calculation of efficiency metrics and requirements for data verification.

In terms of environmental pollution, the global cap of 0.5% sulphur content of the fuel is coming into force as of 1st January 2020. As of March 2020, the carriage of non-compliant fuel for combustion purposes, for propulsion or operation onboard ships, will not be permitted, unless a ship is fitted with a scrubber. From the Shipowners' and operators' point of view, 2018 was the time to decide on the most appropriate approach towards the alternative solutions to comply with the new sulphur cap, while remain commercially sustainable in the long term. The aforementioned options, are either to choose compliant low sulphur fuel/ blended fuel or adopt strategies, such as the installation of Exhaust gas cleaning systems (EGCS, also known as scrubbers) and continue using high sulphur fuel oil (HSFO) or switch to LNG as fuel.

Each option will introduce new challenges to Shipowners, as the IMO 2020 compliant fuels, which are likely to be VLSFO marine fuel blends that are primarily distillate, are expected to have a price differential compared to HSFO, though the future prices have not been



established yet. Moreover, the new fuels are currently under development and do not have any standardization, since they are not covered by the current ISO 8217:2017 standard, a fact that is creating increasing concerns about their quality, as the care of fuel onboard remains the responsibility of the Shipowner. It is therefore imperative, that all necessary measures are taken on time, in order to address possible issues associated with substances contained in the fuel concentration, which may endanger the ship's safety and operation. Under the new guidance, Shipowners are required to develop an implementation plan for 2020, covering issues related to the use of compliant fuel, such as risk assessment, segregation capability, cleaning of tanks dedicated to new sulphur or modifications and fuel oil changeover plan.

The LNG conversion, although being environmental friendly, requires significant capex and is a complicated retrofit, as it involves cargo capacity loss due to increased storage. On the other hand, the investment on Scrubbers, is a solution with a shorter payback period, requiring a capex for the retrofit, between 2 to 3 million USD, depending on ship type, which is being viewed as an environmental alternative, allowing the ship to continue running on HSFO and offers various options for customized installation without major structural modifications or cargo loss. Furthermore, the Scrubber-predicted numbers seem to be validated as based on the latest published reports in early 2019, about 3,300 vessels have either ordered or installed scrubbers, while ICE Delft had predicted in its official IMO Fuel Availability Report, that in 2020 3,800 vessels would be operating with scrubbers! Shipowners who are installing scrubbers on part of their fleet, will gain an advantage, by securing flexibility and higher utilization, especially for the vessels which are on the spot market. A limitation of the scrubber, is that there are strict domestic washwater discharge regulations and operations for the open loop system, which uses sea water for the scrubbing process that is then discharged overboard. An anti-scrubber movement was witnessed over the last months, including the local restrictions and ban of the water discharge from open-loop scrubbers, by some big Port Authorities such as Singapore. Nevertheless, the aforementioned wave appears to be fading, based on the latest announcement from several Port Authorities around the world, indicating they have no intention of banning the use of open-loop scrubbers in their waters since up to now there is no compelling research that has come to light suggesting they should.

Last but not least, the ballast water treatment systems have entered into force since September 2017 and the implementation schedule remains unchanged. The new ships are required to install and comply with the D2 standard while existing ships, which are subject to the implementation schedule, have a deadline until September 8, 2024. The US Coast Guard has now approved 18 systems to perform the task and another 11 are under review. Owners are now required to proceed with considerable investment and installation in order to comply with both IMO and USCG laws. The IMO, during 2018, considered that the inclusion of information on contingency measures in the Guidelines for ballast water management and development of BWM plans, is important and should be done as soon as possible.

OUR PROJECTS

To improve is
to CHANGE,
to be PERFECT is
to change often
- Winston Churchill

ON LINE DATA ACQUISITION & PROCESS SYSTEM

VESSELS ENROLLED DURING 2018

In 2018, the number of vessels with "On line" system monitoring is 29 and remains practically the same when compared with 2017.

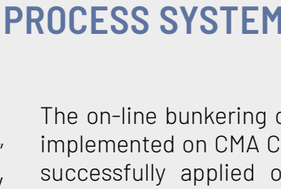
On-line reefer monitoring is available for 18 Danaos vessels. The vessels' actual power efficiency is calculated by monitoring the actual load of reefers. The reefers total load is either fetched from reefer panels or calculated as the total generator power output subtracting power of all other consumers in case the direct reefer power measurement is not available. The above raw input, in combination with a number of other data processed through WAVES' algorithms, provide a reliable base for assessing the effectiveness of the energy management system onboard, ensure optimum energy use and minimization of energy losses, while also trigger the implementation of corrective actions and adjustments where necessary.

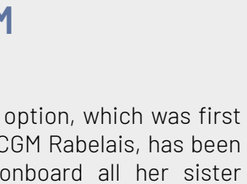
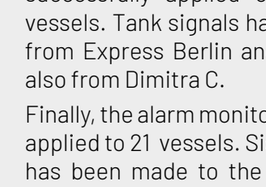
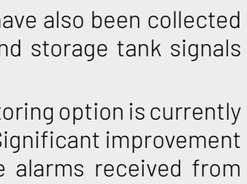
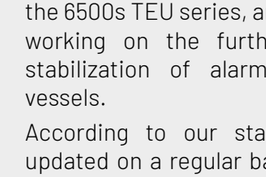
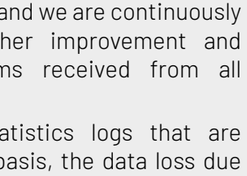
The on-line bunkering option, which was first implemented on CMA CGM Rabelais, has been successfully applied onboard all her sister vessels. Tank signals have also been collected from Express Berlin and storage tank signals also from Dimitra C.

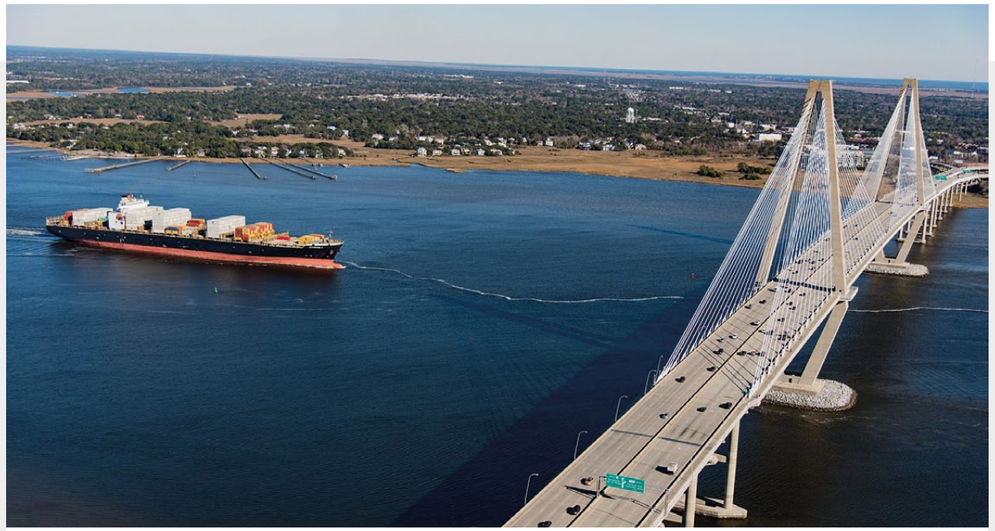
Finally, the alarm monitoring option is currently applied to 21 vessels. Significant improvement has been made to the alarms received from the 6500s TEU series, and we are continuously working on the further improvement and stabilization of alarms received from all vessels.

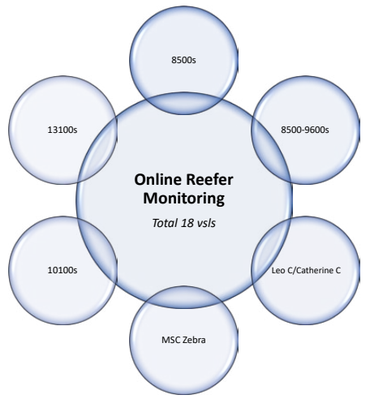
According to our statistics logs that are updated on a regular basis, the data loss due to equipment failure, on-line system hardware failure or communication issues between the servers, for the sum of vessels and the total number of parameters monitored within 2018, is below our target limit of 2%.

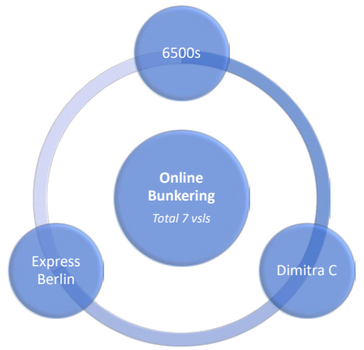
Zim Luanda	1 x 4,253 TEU
CMA CGM 6500s	5 x 6,500 TEU
8500s	2 x 8,468 TEU
CMA CGM 8500s	5 x 8,530 TEU
9600s	2 x 9,580 TEU
10100s	3 x 10,100 TEU
13100s	3 x 13,100 TEU
MSC Zebra	1 x 2,500 TEU
Dimitra C / Performance	2 x 6,400 TEU
Catherine C / Leo C	2 x 6,200 TEU
Genoa	1 x 5,500 TEU
Colombo / Singapore	2 x 3,314 TEU

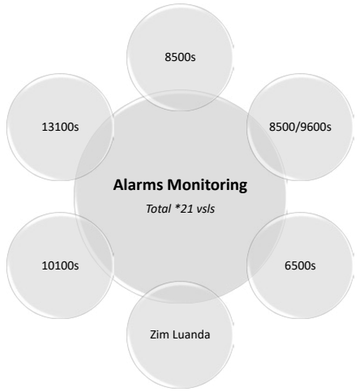


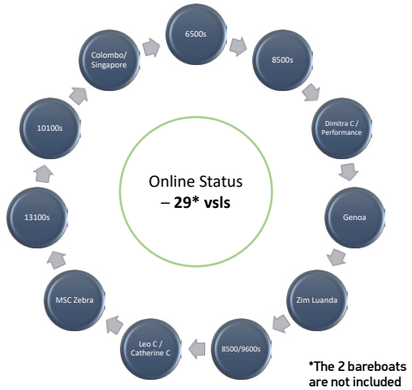
















WAVES

In a constantly changing and demanding shipping environment, where environmental regulations are imposed and vessel's efficiency has become a top priority, DANAOS keeps evolving WAVES in order to gain the utmost through data analytics and algorithms development. Our intelligent framework, acts as an umbrella platform that enables the unified representation and visualization of enormous volumes of heterogeneous data, realizing superior decision making process through synergies between modern Big Data Analytics techniques and the accumulated technical and operational expertise of DAS.

The following key areas are covered:

Performance Monitoring
- Dslip & Slip profile
- Bunkering Control System
- P-Matrix
- Emissions Control
- Performance graphs
- Hull Cleaning

Ship Management
- Bunker Monitoring
- Steam management
- Tanks Management
- Sludge Management
- Power Management
- FW production
- Lubricants plan

Operational Profile & Statistics
- Stowage Analysis
- Trim Profiling
- Off-hires
- Vessel Utilization
- Port Statistics
- Speed Deviation
- Reefers profile
- Draft Distribution

Commercial
- Benchmarking
- C/P Deviation
- C/P Violation alert

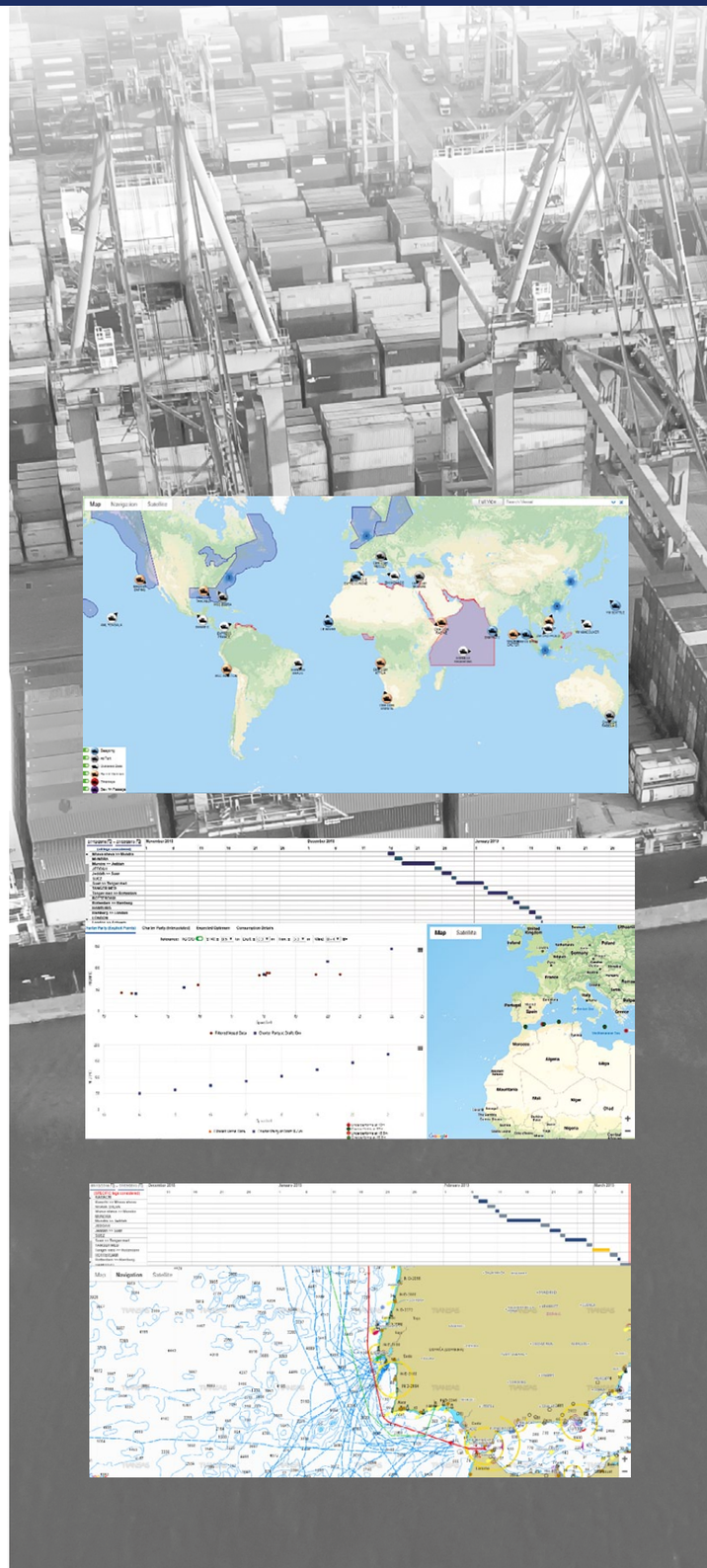
Voyage Info, Financial
- Weather Assessment
- OPEX

Enveronmental Reports & MRV
- MRV Report
- SEEMP indices
- Yearly Profiles

The importance of location data continues to grow and so do the ways to visualize this information. Within 2018, the new MAP has been designed and introduced into Waves. The new Map is an animated interactive map visualizing the actual position of all ships of the fleet at once and in real time, while at the same time illustrating the most recent data using a series of filters.

The user can select to focus on a specific vessel and examine it on a three polar basis; consumption monitoring, navigation and crew list information. The consumption monitoring provides the user with a view of the ship's actual performance during its voyages, compared with the Charter party curve, under the same operational conditions (speed, wind, draft and trim). Graphs with the actual data are plotted and relevant points are also demonstrated on the Map, while at the same time, by using filter tolerances and the timeline feature (the user can select a specific voyage), the vessel's consumption data can be plotted under the desired operational conditions. The user can also have a view of the vessel's actual consumption, compared with the Expected optimum, which is defined as the forecasted approach of performance, taking into consideration major factors, namely, draft, weather, trim and hull condition. Finally, the user can have a view of a leg's consumption benchmarking along with vessel's best and worst consumption at the specific leg, as well as, sister vessels' group average consumptions at the same leg in the same period (winter or summer).

On a weekly basis, a Charter Party violation alert is produced and provides Management, Technical and Operations Department persons in charge with an overview of the actual performance of the vessel, compared with the charter party consumptions, given that necessary conditions for speed, draft, weather and trim are met.



Through the navigation utility, the user is provided with a visualization of the vessel's location data, representing the leg or route of the vessel, while at the same time demonstrating the passage plan in order to indicate the vessel's voyage in comparison with the nautical maps plans.

The Superintendent Inspection Report (SI Report), has been designed as a new application and incorporated in the Waves Fleet Performance platform, where standard format is used and specific fields for data entry exist, including Seaman Evaluation (SEA) in the same reporting environment. Reports & Statistics can also be produced and further assessed.

The Lubricants plan has also been incorporated in Waves in the form of an automated alerting system, in order to give relevant notice to Technical and Supply Department persons in charge, when the vessel is approaching the lubricants supply port or about vessel's remaining onboard (ROB) quantities, in comparison with, the safety quantity that shall be available onboard as per company's policy.

The Hull Cleanings Timeline routine has been designed as a new application and incorporated in the Waves Fleet Performance platform and is a visually engaging tool that allows the user to evaluate the vessel's performance over a period of time, along with, the impact of hull cleaning and propeller polishing, as well as, the performance after Dry-docking.

Keeping the hull clean and in good condition can ensure that the vessel's speed and fuel efficiency is maintained and environmental impact is reduced.

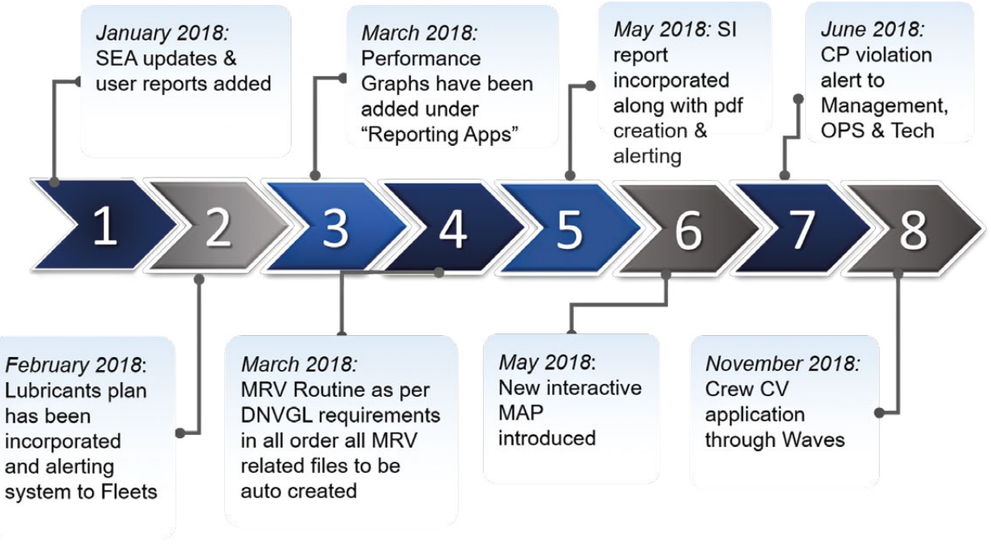
The cleanings timeline is designed to provide a quality overview and is a reporting tool for our ships monitoring, by illustrating the vessel's performance trend throughout its lifetime, while at the same time, plotting the major cleaning events on the same timeline, to demonstrate their effect on hull efficiency.

Another important milestone in 2018, is the incorporation of EU MRV reporting in the Waves

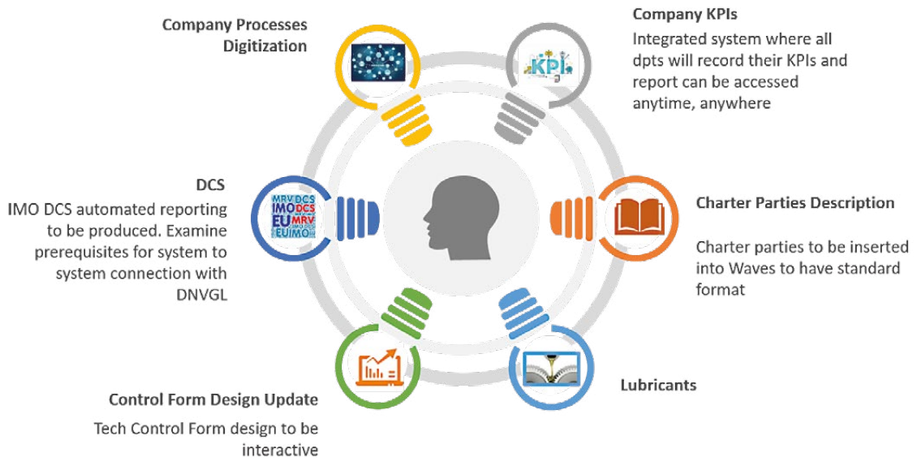
Fleet Performance platform. The MRV routine is designed to produce the required automated reporting based on DNVGL requirements, while at the same time, providing additional checking of reported data and continuous alerting for any new vessels that visited EU ports. The same routine will be further adjusted in order to incorporate IMO DCS reporting, for the first reporting period that starts on 1st January 2019 up to 31st December 2019. As a next step, the prerequisites for system to system connection with DNVGL will be examined, in order to be implemented in Waves after a successful trial period and in future, achieve a fully automated process and transfer of files.

WAVES is fully integrated in the Danaos management system, providing personalized role-specific dashboards and maritime business operational intelligence, creating a true competitive advantage in ship management. The incorporated algorithms and visualization tools transform data into useful information, assisting company's employees with the decision-making process, while eliminating the reaction time.

Below are WAVES' major milestones presented for the year 2018:



For 2019, DANAOS focuses on turning its processes fully digitized via its state-of-the-art WAVES architecture, and be able to become a trusted link in the chain of new era of operations. Below is an illustration of the WAVES' next steps for the year 2019:



DATA EXCHANGE & API SYSTEM PREPARATION

Though the fundamentals of shipping are always going to be the same, the new business and operational intelligence requirements are changing at a very fast pace. Danaos embraces the concept of fully digitizating its processes and operations via its state-of-the-art WAVES architecture and aims to the company's transformation as a "Block Chain Ready" partner. An important driver for the optimization of digitization, is the transparent data exchange that enables all involved parties to share and access relevant data, ensuring the same situational awareness on the basis of multiple input and providing a holistic view. In the long run, this will allow the efficiency and reliability with our invaluable customers to improve.

Moving forward in this direction, all relevant documents (technical and operational forms, certificates, manuals, etc.) are stored centrally, while the form completion (either at the office or onboard the vessels) is not executed with the use of excel anymore but via computerized forms with full & advanced validations of each single field in order to avoid any potential inconsistencies, typos and/or errors caused due to the human factor.

Moreover, several fields (as many as possible) are automatically filled in upon creation of every form based on information related to each vessel/crew member/engineer/etc., while others can be filled in with values belonging to strict predefined sets. All documents are continuously monitored for the prevention of unauthorized access or even defacing, while a sophisticated access rights system ensures that the provided data can be accessed and/or modified only by the designated persons.

An advanced versioning system also keeps track on the updates of the form templates along with their creation and modification. As a result, the company's data is digitized, well-structured, characterized by integrity and freshness, enabling the company to be ready and confident to timely share this data with its stakeholders. At the same time, Danaos has unlocked the potential for statistical analysis & profiling of data, whose management & processing was considered impossible until now, mainly due to the loosely structured documents mostly due to the lack of validations over the collected data.

For the most effective vessel performance monitoring, all data received is properly cleaned and cross-checked (even via data fusion, i.e. creation of higher level information through the combination of more than one data streams and validation against physical or DANAOS-specific empirical laws) for inconsistencies, faults, noise, etc. Abnormal data is filtered out and the respective data providers (i.e. sensors or existing equipment output) are marked for (re)calibration or replacement. Data is then fused together to provide higher-level valuable information to ensure access efficiency and then are formally structured and stored to secure redundant DBs ensuring their long-term preservation. Any potential changes (e.g. data normalization after sensors recalibration, missed data recovery, etc.) are rapidly reflected on the stored data, ensuring the freshness and integrity of our data security.

As the name Data Exchange suggests, it reflects the two way partnership of information sharing between two parties.

This enables us to find smarter and more efficient ways of improving the delivery of information and the overall outcomes. Moving our architecture towards data sharing, our system is designed to provide strict and formal APIs for enabling third-party stakeholders, to have automated access to our data in a formal, real-time, secure, efficient and controlled manner, while eliminating compliance issues, duplication of effort, data losses and long processing times.

"The goal is to turn data into information, and information into insight

- Carly Fiorina

Former CEO of HP

RETROFITS & OPTIMIZATIONS

The optimization of hull form continues to grow for the shipping industry, as a means of improved ships energy efficiency and advanced performance. Danaos has supported this maritime energy transition throughout the years by performing several optimization studies and thoroughly examining numerous advanced energy efficiency saving devices and design methods, in order to identify the real saving of each one, when applied to our vessels. While seeking to maintain its pioneer position, in operational efficiency and technological innovation, Danaos proceeded with various retrofits within 2018, making our vessels more commercially attractive, with improved efficiency, satisfying the current needs of a demanding market.

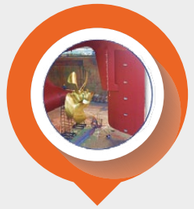
A bulbous bow retrofit, was carried out on our 6500 TEU vessels, CMA CGM Musset, CMA CGM Nerval, CMA CGM Rabelais and CMA CGM Racine during their drydock within 2018.

All dry dockings were completed at the Cosco Shipyard Co. Ltd. in Zhousan, China in April, May and June 2018. Speed tests, under the desired conditions were performed on all vessels, after their departure from the shipyard, in order to create their new reference condition and study the bulbous bow effect by verifying the saving in terms of either saving or penalty.

Danaos in the previous years, conducted various technical upgrades, to allow our vessels to become more flexible operationally and commercially attractive, with a key driver being to address our charterer's key needs.

The main scope was to thoroughly examine the possibility of applying technical design improvements on all company vessels, based on the current market requirements and trends. In the above context, draft increase, M/E SFOC Optimization, as well as modifications needed for compliance with the new Panama Canal and AMSA rules were carried out.

OUR MAJOR OPTIMIZATION PROJECTS, COMPLETED AS OF 2018 ARE SUMMARIZED BELOW:

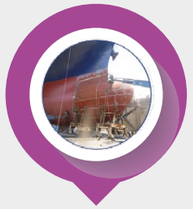


2016

8100s BB OPTIMIZATION
8100s NEW KAPPEL PROPELLER & PBCF
8100S ENGINE DERATING

2017

10100s BB OPTIMIZATION
10100s LOW FICTION PAINT APPLICATION
4300s SHORTERING



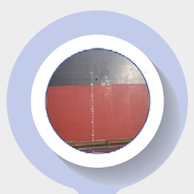
2018

6500s BB OPTIMIZATION

NEXT →

2019

8500s, 9600s, 13100s, BB OPTIMISATION
6500s, 8100s, 9600s, 13100s SCRUBBER INSTALLATION

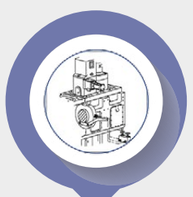


DRAFT INCREASED

8X2200s INCREASED BY 0.28M
(FINAL 10.78M)

PANAMA CANAL MODIFICATION

1X5500s, 4X6500s, 1X8500s, 2X9600s



M/E SFOC OPTIMIZATION

2X8500s

AMSA MODIFICATION

3X6500s

Sustainable development is that which meets the Needs of the Present without compromising the ability of future generation to meet their own needs

Gro Harlem Brundtland

WATER BALLAST TREATMENT

Within December 2018, Danaos has successfully installed and commissioned the first WBTS of the fleet onboard the Express Black Sea, one of our 3400s vessels, during her normal drydock. The system installed is the Alfa Laval Pure Ballast 3.1 Compact Flex 500m3/h.

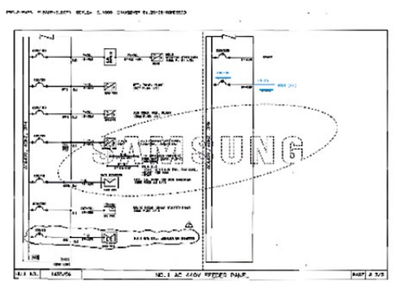
2018 - The Pilot Road

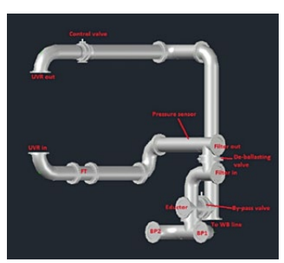
Within Q1 2018, a mapping of the whole fleet was made, with all installation dates according to the IMO and USCG, in order to identify which vessel/vessels would be the first that would require WBTS installation. During the same period, Danaos contacted several makers in order to identify the more robust system and maker that would be a best fit for our vessels. After thorough comparisons and extensive meetings, the Alfa Laval Compact Flex system was selected for installations that would take place within 2018.

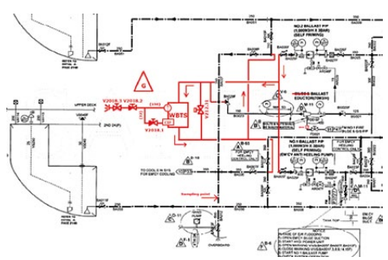
In early April 2018, a specialized team that would handle all the engineering of the project was established and arranged a customized training at the maker's premises, in order to cover all operation and installation aspects of the project and set up a process for the smooth evolution & progress of all Danaos projects going forward.

Following all of the above, within Q2 2018, the Danaos Engineering Team, prepared all relevant drawings in order to send them to the maker for review. The relevant isometrics, 3D models, updated piping & electrical drawings, ER Arrangement & Hull Penetration procedure for the new overboard was prepared. Moreover, a detailed list with all valves positions and combinations, which may result in ballasting or deballasting by gravity operation, was created, in order to record same in a log box and create a relevant log to ensure that no violation of the regulation takes place.

Valve number	Valve type	Ballasting by gravity	Ballasting by gravity	Ballasting by gravity	Ballasting by gravity	Ballasting by gravity	Ballasting by gravity	Deballasting by gravity	Deballasting by gravity	Deballasting by gravity	Deballasting by gravity	Deballasting by gravity	Heating	Comments
BA001F	Remote	●	●	●									●	In case any of the monitored vlvs combination is detected then relevant msg such as "Ballasting by gravity, etc." alert should appear. Green marks indicate open valves, while red closed valves positions.
BA003F	Remote	●				●								
BA021F	Manual		●			●	●							
BA022F	Manual		●			●	●							
BA004F	Remote		●		●									
BA015F	Remote			●			●							
BA002F	Remote				●	●	●						●	
BA010F	Remote							●		●				
BA008F	Remote								●	●				
BA013F	Remote							●	●	●	●	●	●	
BA009F	Remote								●		●			
BA007F	Remote							●			●	●		
BA014F	Remote											●		
V212.31	Remote												●	





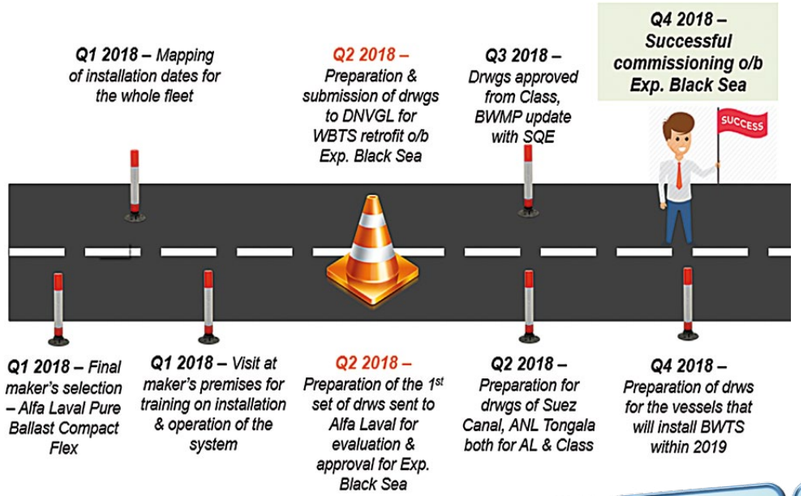


Within Q3 2018, class approval for all the modification drawings was received from DNVGL & NK (the classification societies of the first two vessels on which the BWTS was going to be installed).

The Ballast Water Management Plan (BWMP) was revised, in order to reflect the D2 standards and BWTS integration. The plan has been submitted and approved by the corresponding classification societies and flag administrations, where required.

The first installation was successfully completed and commissioned in the presence of a class surveyor and Alfa Laval engineer, within December 2018. The system has been in operation since then and the responsible fleet has prepared detailed checklists in order to monitor the system's performance, while relevant jobs have been recorded in the Danaos PMS, as per maker's recommendations.

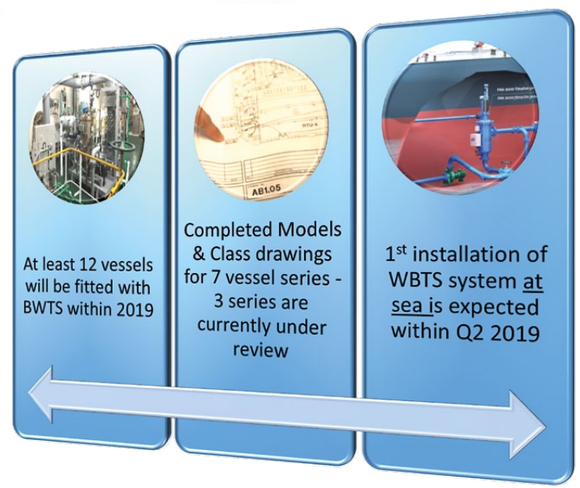
An overview of the process and steps made within 2018 is depicted below:



And the future holds ...

Detailed logs and relevant procedures have been set-up, in order to closely monitor the whole process, considering the delivery time of the unit, the drawings' approval time and finally the installation and commissioning time, depending on whether it will take place at sea or at drydock!

Deadlines are strict, standards are high, close monitoring is essential!



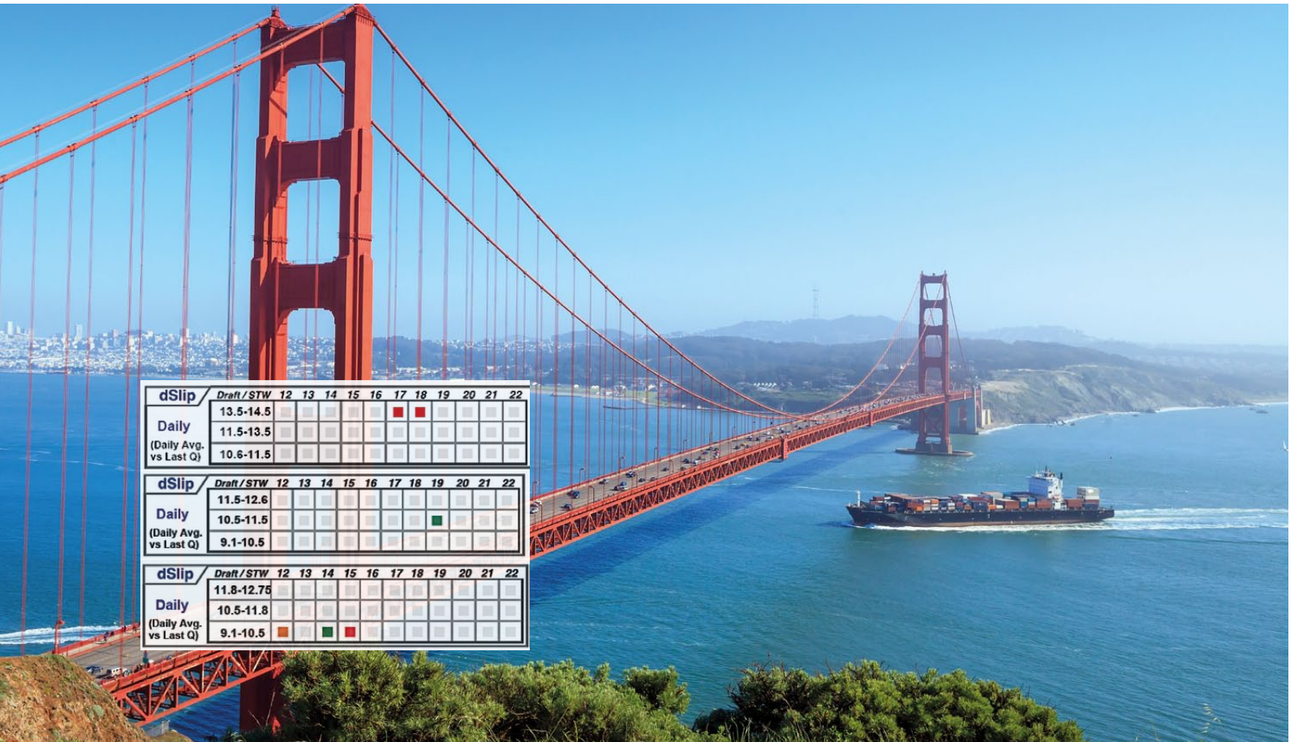
PERFORMANCE MONITORING

Nowadays, when the bunker market is unstable & bunker costs are high, the performance of the vessels, in terms of hull & engine performance, is imperative and crucial, in order to retain the competitive advantage and keep on serving clients needs in a timely and qualitatively manner. Danaos, through Waves, has created various routines and tools in order to automate the monitoring procedure.

Within 2019, Danaos has established monthly meetings with Maersk's performance team in order to discuss and exchange views on the Maersk-chartered vessels, in an effort to create common reference lines and benchmarking, aiming to optimize vessels' performance. Maersk has established its own benchmarking scorecards, which are also produced every month and discussed accordingly. Moreover, M/E performance forms are shared with our clients on a monthly basis.

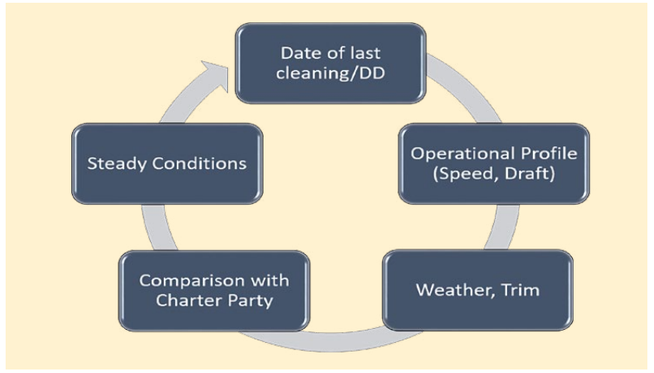
Within 2018, we discussed and set the grounds for a common performance understanding and evaluation of several of our vessels with our clients, i.e. CMA CGM, Yang Ming, MSC & Hapag Lloyd.

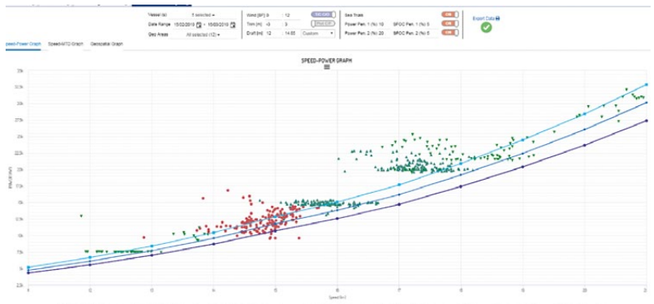
In order to evaluate the performance of the vessel and conclude as to whether hull cleaning is needed, there are a lot of parameters that should be taken into account. It is of the utmost

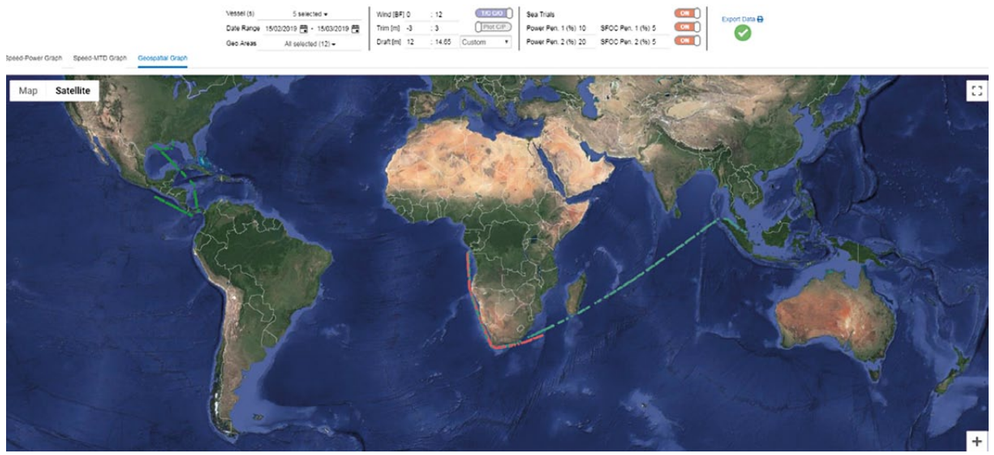


importance, to exclude the operation in critical draft area, where power demand is higher than expected and vessel's performance cannot be evaluated. The Dslip routine, which is also inserted in Waves Fleet Performance and incorporated in control form, is a tool for evaluating vessels' hull performance. The system compares the daily dslip with the average dslip of the previous quarter under the same operational conditions. Their difference is compared with predefined limits and the relevant table is depicted with either green, orange or red color.

Cleanings and major event time, has been incorporated in Waves Fleet Performance, in order







to evaluate every event in terms of savings, duration, etc. Within 2018, Danaos has also launched the Performance Graphs application, where the user can select their own filters (draft, trim, BF, trading area) and can also plot trial curves of the vessel, with the desired penalties on power and on consumption. Of course, the user can select more than one vessels, having the ability to compare sister vessels performance on one graph. The user can also plot the C/P, in order to have a view of the actual performance versus the contractual one.

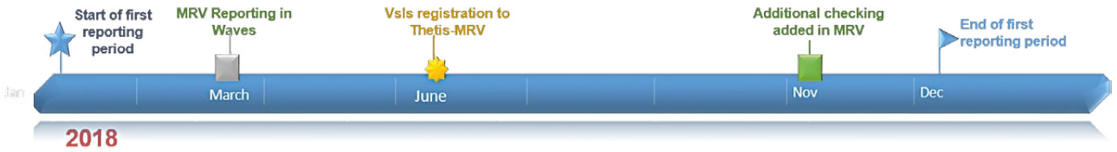
MRV & IMO DCS EMISSIONS REPORTING

In the context of the new EU MRV regulation (Monitoring – Reporting – Verification), entered into force on 01 July 2015, Ship owners and operators shall monitor, report and verify CO_2 emissions of their vessels larger than 5,000 GRT annually per voyage between and in/out of EU ports and report to independent verifiers. The main objective of the MRV is to gain insight and control fuel consumption & emissions from shipping activities, in the context of the global combined effort to minimize environmental impact.

2018 is the first reporting year for ship emissions in the EU. A specific MRV routine, has already been incorporated in Waves since 2017 and within Q1 2018 the routine was finalized, in order to align its exports with the verifiers' (DNVGL) requirements. All vessels, for which a monitoring plan has been created have also been registered in Thetis, as regulation imposes, by Danaos. Since the Waves system, continuously checks all ports of call of the Danaos vessels, an additional alert was incorporated, in order for the system to verify, that a monitoring plan is in place for all the vessels that call an EU port, i.e. if the system detects, that a vessel called an MRV-related port and no monitoring plan exists, then the relevant alert, notifies the PICs, in order to proceed with the necessary actions for the monitoring plan creation.

Moreover, throughout 2018, the Danaos R&D department, identified some minor reporting inconsistencies in the vessels' telegrams, which would most likely have created reporting issues in future. An automated alert system, was created, in order to check all telegrams received and whenever an inconsistency or an error is found, a message is sent to the PICs, containing all necessary details, in order to find the inconsistency and proceed with relevant updates. The same applies with any port that is not currently inserted in the Danaos database, i.e. an alert is produced in order to add the port to the company's port list.

The below timeline, summarizes all actions related to the MRV regulations that have taken place within 2018:

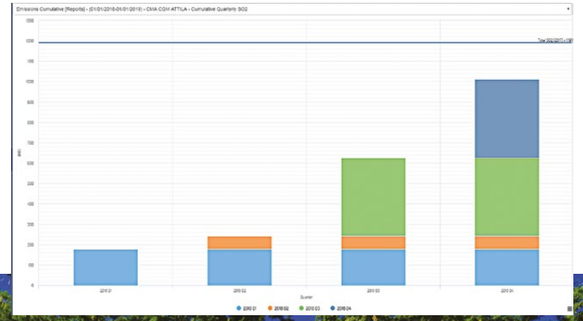


Within January 2019, all MRV reports were submitted to DNVGL for verification. The verifier has made a few comments on the submitted files, all necessary updates have been completed and MRV reports were verified in March 2019. The final xml files were received from verifier by the end of within March 2019, uploaded in Thetis platform, and the verified emissions reports and DoCs were sent onboard our vessels prior 30/04/2019 as the regulation requires.

In order to further automate the process, Danaos developed a tool, within the MRV reporting feature in the Waves Fleet Performance application, where the user can enter the reporting period required produce the report, and a list with all vessels that have at least one MRV related call appears, in order to reassure that no vessel has been omitted from the reporting.

The environmental monitoring policies and strategies are incorporated in our core management practices, as the CO_2 emissions are included in the Environmental report that is produced and published every year since 2010, along with the relevant efficiency index.

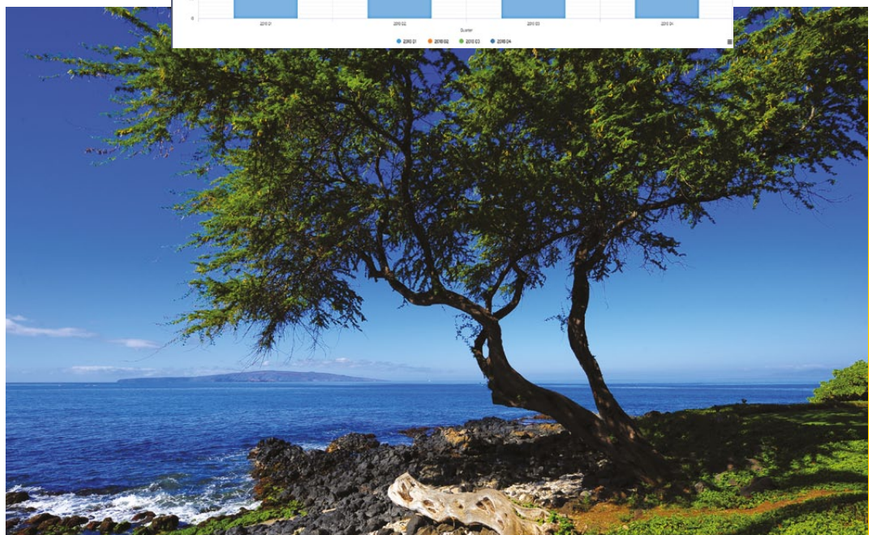
It should also be noted, that the CO_2 emissions calculations are already reported through the Danaos Waves performance monitoring tool and relevant reports are produced on a quarterly basis, also indicating the cumulative emissions per quarter compared to last year's value per vessel. The below screenshot, indicates a sample of a cumulative emissions graph which the user can produce; it gives a quick overview of the emissions production for each quarter, since every quarter is depicted with a different color. Moreover, the total emissions value for previous year is also shown, in order to have a quick overview about whether the vessel has produced more emissions within the examined year compared to the previous one.



The emissions routine designed by our R&D department, provides a thorough insight on the control and monitoring of ship emissions and allows us to regularly monitor the fuel efficiency of all our ships, constituting a valuable tool for MRV and IMO DCS emissions reporting.

Danaos has also voluntarily taken part in DNVGL's EEOI certification program since 2008, monitoring the performance and CO_2 emissions of 20 of our vessels. Since the end of 2016, we count 20 vessels on our fleet having an Energy Efficiency Operational Indicator Certificate from DNVGL. More details on the EEOI certification are shown in the relevant section with the EEOI for the whole Danaos Fleet.

SEEMPs have been onboard Danaos vessels since 2012, prior to its implementation becoming mandatory. SEEMP goals are evaluated every year, through detailed technical analysis and comparison of the vessel's consumptions and operational profile. The new regulation 22A of MARPOL Annex VI introduced by the IMO in 2016, requires for ships larger than 5,000 GRT the SEEMP to be



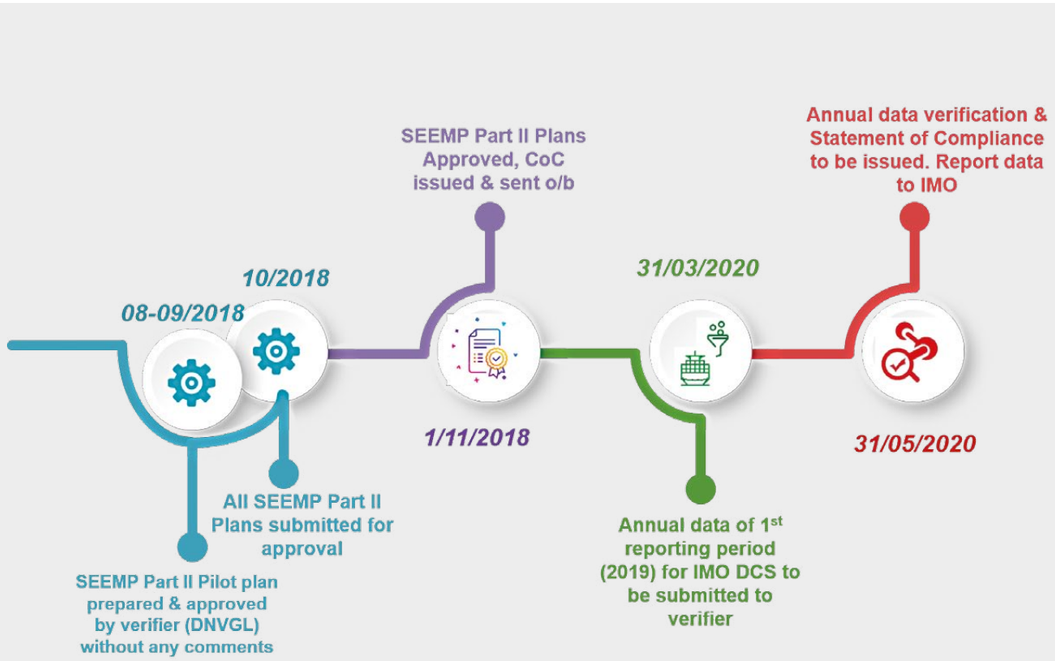
THE ENVIRONMENTAL MONITORING POLICIES AND STRATEGIES ARE INCORPORATED IN OUR CORE MANAGEMENT PRACTICES

updated with a new "Part II", with a description of the methodology that will be used to collect fuel oil consumption data (Fuel oil data collection plan).

SEEMP Part I, provides a possible approach for monitoring ship and fleet efficiency performance over time and some options to be considered when seeking to optimize the performance of the ship. SEEMP Part II, provides the methodologies that ships larger than 5,000 GRT should use, to collect the data required pursuant to regulation 22A of MARPOL Annex VI and the processes that the ship should use to report the data to the ship's Administration or any organization duly authorized by it.

Within Q2 2018, Danaos prepared a pilot plan and sent it to DNVGL, who is the selected verifier, and it was approved without any comments. By October 2018, all SEEMP Part II, have been submitted for approval and on November 2018 all CoCs have been issued and sent onboard. Wherever necessary, the flag administration was contacted, in communication at the same time with DNVGL, in order to complete the process and issue the necessary certificates. The below timeline summarizes the process for the IMO DCS regulation:

The first reporting year is 2019. Within 2018, Danaos was in close contact with DNVGL, in order to fine tune, simplify and automate the reporting process for the MRV, thus no additional updates need to be made in the Waves Fleet Performance, as the same files need to be submitted for the IMO DCS. Danaos is ready for the IMO reporting!



"On earth there is no heaven
but there are pieces of it"

Jules Renard

CSR / GRI & ISO 50001

"Change" remains the only constant, in the current business shipping environment! Technology & all the opportunities that come along keep increasing, making Danaos' mission to implement the highest standards in terms of safety, efficiency & reliability even more imperative. CSR remains inevitably a fundamental priority, which Danaos supports and continues with the voluntary reporting of GRI (Global Reporting Initiative). The sustainability and CSR report of Danaos, represents the strategy and policy of the company, along with the accompanying actions that support the company's focus on the Environment, the Society, the Employees and the Marketplace.

Danaos' core values, include and promote personnel training (both on board and ashore), participation in joint R&D projects & bonding activities, while continuously seeking growth and a leading position within the container market sector. Through CSR and GRI reporting, Danaos makes it clear to its stakeholders, that all of its activities remain under the umbrella of ethical business practices and strategies, with initiatives promoting the sustainable development of the shipping industry and global economic sustainable growth.

Through the sustainability report and the GRI indicators, Danaos enhances the transparency and commitment to innovation, in the context of high ethical conduct and environmental and social sustainability. Moreover, under the umbrella of expanding the environmental management practices, cost reduction and effect operation, from 2015 onwards Danaos is ISO 50001 – Energy Management, certified by DNVGL.

The ISO 50001, has been adopted by our Piraeus Branch office and on four vessels of the fleet. In close cooperation with our auditors, DNVGL, Danaos has improved the company's management practices, procedures, record keeping and several activities of the company that require significant energy use, in an effort to start improving efficiency from the inside. Within 2017, two more vessels were enrolled, however, one of them was bareboat chartered in mid-2017, leaving the total number of vessels enrolled to four. The same applies for 2018. The four vessels selected are of different sizes categories.

The implementation of the ISO-50001 standards, contributes towards an improved environmental footprint and cost saving, through systematic monitoring and control of energy usage and conservation. The ISO 50001 certification (where adopted), as well as, the SEEMP implementation, are stimulating more energy efficient operational practices and development of means and metrics to evaluate them and assess their actual impact. The performance of the enrolled vessels and the building's energy consumption, are monitored and evaluated on a quarterly basis and meetings are held with all the departments involved, in order to assess and evaluate the results and to set or adjust goals as necessary. The relevant report is produced and circulated to all parties involved.

SCRUBBERS

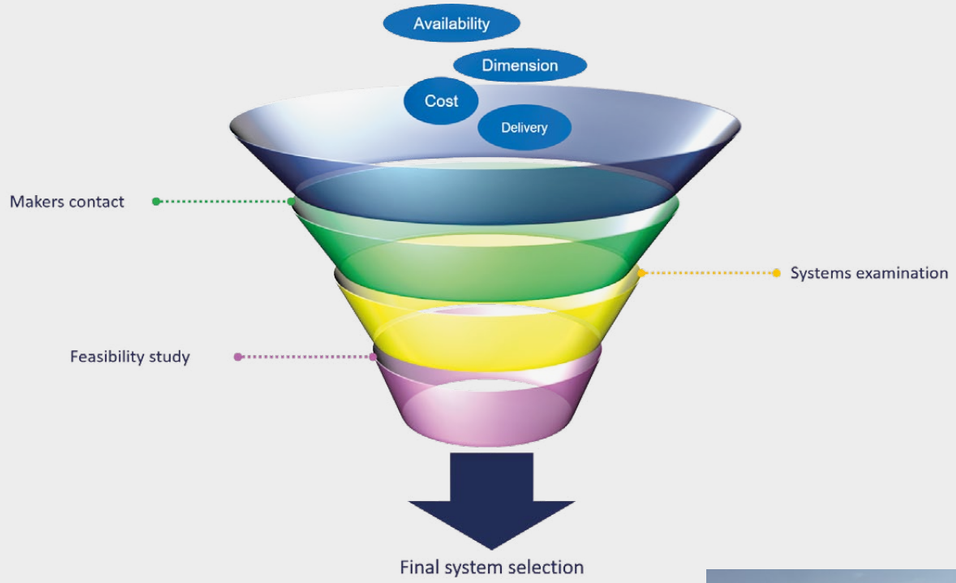
As new global regulations have put in place a cap on sulphur emissions (SO_x), the maritime industry is coming across serious environmental challenges in adopting the right method of compliance to reduce sulphur emissions to the permitted levels. The new IMO Regulation for the global 0.5% fuel sulphur limit will enter into force on January 1st, 2020 and from March 1st, 2020, no vessel will be permitted to have marine fuel with sulfur content higher than 0.5% onboard, unless it is fitted with a SO_x Scrubber, enabling it to achieve an equivalent method of compliance. The aim of this new Regulation, is to reduce the industry's global and local emissions and to significantly improve the environmental impact and air quality.

As part of our continuous focus, on positioning our fleet, ahead of the new global sulphur cap regulations, Danaos, throughout the previous years, has been studying the main streams for compliance with the new regulations in view of IMO 2020, which are either to switch to an alternative fuel or to invest in exhaust gas cleaning systems (also known as scrubbers) for our ships and continue to use high-sulphur fuel. The Open-loop scrubbers use seawater as the washing agent, then discharge it again after use. Therefore, the vessels that are fitted with scrubbers will not be required to remove the non-compliant fuel, and will be able to continue being supplied with it, and burning it on or after 1st March 2020.

Prior to the selection of a compliance option, the proper assessment of the risks involved was undertaken in order to consider all operational and safety issues apart from the cost element.

During 2018, Danaos contacted 22 Exhaust gas cleaning system manufacturers, studied the various systems available in the market and through its discussion with technical experts and classification societies, was able to consider all various factors before selecting the most suitable scrubber type and system for our vessels. More specifically, the availability of systems for our big sized engines, the delivery time and the costs involved, as well as, the system's dimensions that would enable fitting the scrubber inside the vessel's available space without major structural modifications, were the major factors that determined the final selection of the maker with the most appropriate system for our vessels.

Having as a primary focus to provide our vessels



with a further commercial advantage, Danaos during Q3 2018, made a commitment to install exhaust gas cleaning systems on six large sized container vessels of our fleet, the 2x6500, 2x8100 and 2x9600, with the installations to follow in 2019, while scrubber installation will be extended to our 5x13100s as well.

The plan approval, was successfully carried out, in principle, with the Korean Scrubber maker and class approval was also initiated with the LR classification society, for the first vessel's scrubber installation at the end of Q1/2019.

OUR ENVIRONMENTAL PERFORMANCE

Look deep into nature, and you will understand everything better

- Albert Einstein

DANAOS FLEET emissions

Every year, we calculate the emissions of our entire Fleet, aspiring to be fully transparent on the parameters that can influence our efforts towards a more energy efficient management. We use those calculations as indicators of our environmental performance and share them with our clients, upon their request, in order for them to evaluate their fleet's environmental footprint.

All the formulae used for the calculation of our emission KPIs are in line with the ones used by the KPI platform: https://www.shipping-kpi.org/.

We adopted the above approach, in order to use the same reference tool as that of our charterers, so as to be fully aligned with them, regarding emissions calculations.

CO_2 EMISSIONS

References: IMO MEPC/Circ.471: Interim Guidelines for voluntary ship CO_2 emission indexing for use in trials. CO_2 emissions in tons are calculated for each voyage of each vessel and then summed up for all voyages of each vessel. They are then summed up for all vessels accordingly. The total CO_2 emissions for the Danaos fleet are produced as per the below formula:

$$\sum_{v}\sum_{i}\sum_{j} FC_{ijv} \times C_{Fj}$$

Where:

- FC_{ij} is the mass of consumed fuel j at voyage i (metric tons) for the vessel v,
- C_{Fj} is a non-dimensional conversion factor between fuel j consumption, measured in grams and CO_2 emission also measured in grams based on carbon content (as per the update of the IMO 2000 study (Buhaug et al,2008))

EEOI (in gr/tons*miles) for each vessel is defined as the ratio of mass of CO_2 emitted per unit of transport work:

$$EEOI = \frac{\sum_{i=1}^{n}\sum_{i=1}^{k}(FC_{ij} \times C_{Fj})}{\sum_{i=1}^{n}(m_{cargo,i} \times D_i)} \times 10^6$$

Where:

- j is the fuel type
- i is the voyage number
- $FC_{i,j}$, is the mass of consumed fuel j during voyage i (metric tons)
- C_{Fj}, is a non-dimensional conversion factor between fuel j consumption, measured in grams and CO_2 emission also measured in grams based on carbon content (as per the update of the IMO 2000 study (Buhaug et al,2008)):

Diesel/Gasoil:	3.20600
Light Fuel Oil:	3.15104
Heavy Fuel Oil:	3.11440

- $m_{cargo,i}$, is the carried cargo mass during the voyage i
- D_i, is the distance in nautical miles corresponding to the voyage i.

The average EEOI of all vessels produces fleet average EEOI.

SO_2 EMISSIONS

References: "An Online Ship Emissions Calculator as a Decision-Making Aid and Policy Evaluation Tool", C.A Kontovas & H.N Psaraftis, Laboratory for Maritime Transport, National Technical University of Athens.

SO_2 emissions depend on the type of fuel and more specifically on the sulphur content of the fuel. One has to multiply total bunker consumption (in tonnes per day) by the percentage of sulphur present in the fuel (for instance, 3%, 1.5%, 0.5%, or other) and subsequently by a factor of 0.02 to compute SO_2 emissions (in tonnes per day). The 0.02 SO_2 factor is exact and comes from the chemical reaction of sulphur and oxygen to produce SO_2.

As far as the SO_2 index is concerned, the following expression found in the literature that gives the equivalent sulphur content per ton-nautical mile has been used for calculating SO_2I for each vessel and the average has been produced giving the SO_2I (in gr/tons*miles)for the whole fleet:

$$SO_2I = \frac{\sum_{i=1}^{n}\sum_{x=1}^{k}(20xFC_{i,x}\times S_{ix})}{\sum_{i=1}^{n}(m_{cargo,i}\times D_i)} \times 10^3$$

Where:

- $FC_{i,x}$, is the mass of consumed fuel x during voyage i (metric tons)
- $m_{cargo,i}$, is the carried cargo mass during the voyage i
- D_i, is the distance in nautical miles corresponding to the voyage i and
- $S_{i,x}$, is the weighted average of % sulphur content of fuel type x calculated by the formula:

$$S_x = \frac{\sum_{j=1}^{n}(A_{x,j}xB_{x,j})}{\sum_{i=1}^{n}(A_{x,j})}$$

Where:

- x, is the fuel type (e.g. HFO, LSFO, MDO etc.) received by the vessel
- n, is the number of bunkering operations in the reporting period
- S_x, is the weighted average of % sulphur content of fuel type x
- $A_{x,j}$, is the quantity of fuel of type x received during bunkering operation
- $B_{x,j}$, is the sulphur content of fuel type x received during bunkering operation

NO_x EMISSIONS

References: The Norwegian Toll and Avgiftsdirektoratet (The Norwegian Customs and Tax department). Document (only available in Norwegian).

NO_x emissions based on the NO_x emission factor equal to 0.100 (ton of NO_x/ ton of fuel) for slow speed diesel engines and 0.07 (ton of NO_x/ton of fuel) for medium speed diesel engines.

The NO_xI emissions index (in gr/tons*miles) for a voyage is calculated based on the below formula:

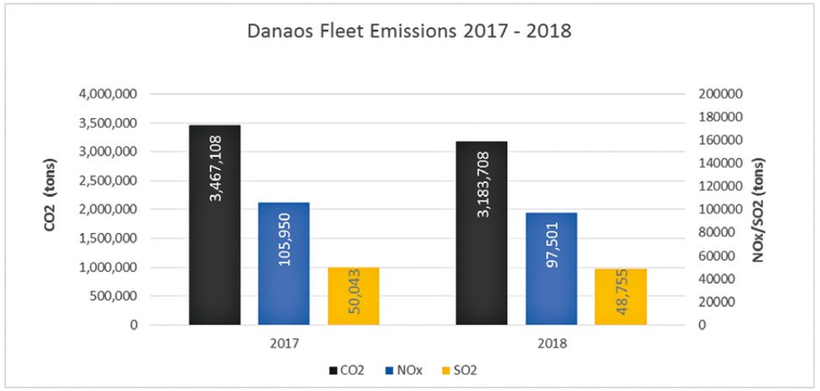
$$\frac{\sum_{i=1}^{n}(FC_{i,ME}\times C_{FME}+FC_{i,DG}xC_{FDG})}{\sum_{i=1}^{n}(m_{cargo,i}\times D_i)} \times 10^6$$

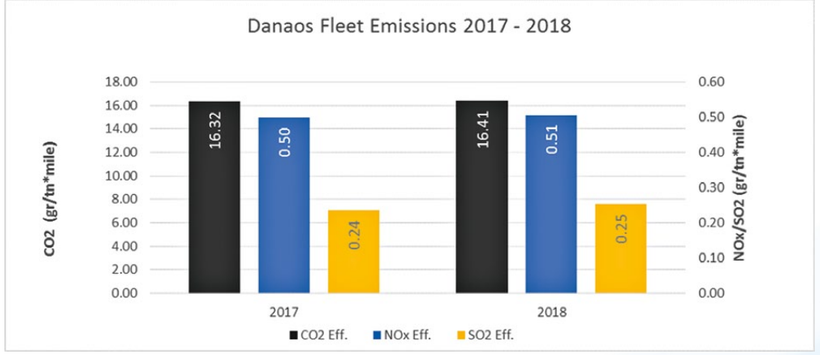
Where:

- i is the voyage number,
- $FC_{i,ME}$, is the mass of fuel consumed in Main Engine during voyage i (metric tons)
- $FC_{i,DG}$, is the mass of fuel consumed in auxiliary engine during voyage i (metric tons)
- C_F, is a conversion factor between fuel consumption, measured in metric tons and NO_x emission also measured in metric tons:
  Slow speed engines: 0.1 mt per metric ton of fuel used
  Medium speed engines: 0.07 mt per metric ton of fuel used
- $m_{cargo,i}$, is the carried cargo mass during the voyage i and
- D_i, is the distance in nautical miles corresponding to the voyage i.

OUR EMISSION KPIs SUMMARY

The below emissions figures and efficiency factors correspond to the total of our operating Fleet during 2018.





As shown in the above graph, the company's environmental footprint decreased compared to that of the previous year. Additionally, the total number of produced emissions for 2018 (CO_2, NO_x, SO_2) is 8.2. 8% & 2.6% lower compared to 2017.

Within 2018, the Danaos vessels' operating days have decreased, despite the fact that idling periods were significantly less, due to the number of scheduled drydocks. Ultra super slow steaming activity has slightly increased, consequently reducing the average operating speed, fuel consumption and CO_2 emitted. Though, as the amount of cargo transferred was also decreased in 2018, along with the miles sailed, leading to a decrease in the tn*miles index for 2018, the increase in EEOI was marginal.

UTILIZATION
96.8% FOR YEAR 2018
FROM 96.4% IN 2017

TECHNICAL UTILIZATION
99.9% FOR YEAR 2018

CO_2 PRODUCTION (MT) - 8.2%

← 2018 ANNUAL AIR EMISSIONS

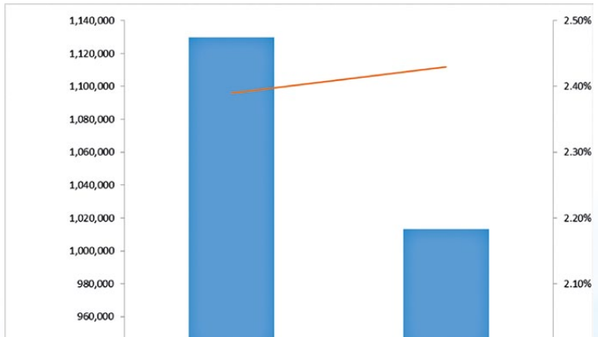
NO_x PRODUCTION (MT) - 8%

SO_2 PRODUCTION (MT) - 2.6%

The effective fleet utilization for the fleet under employment was 96.8% for the year 2018, while the utilization percentage from a technical aspect remains impressive at the level of 99.9%! The above means that the stoppages due to technical reasons account for only 0.1% of the total operating days. The above percentages are considered among the most competitive in the shipping market.

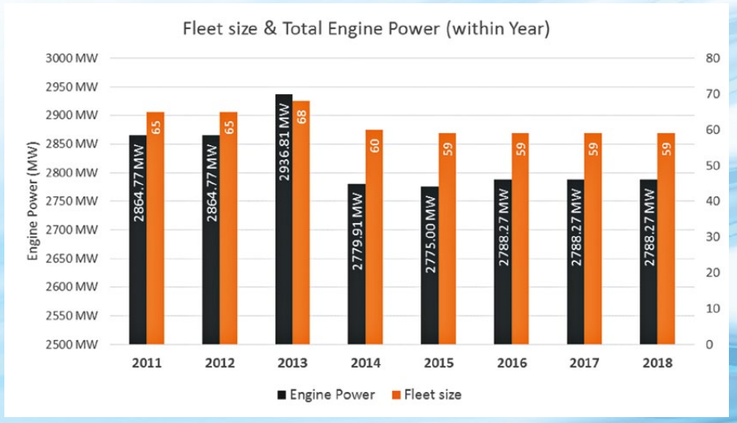
OUR BUNKERS

The bar graph below shows our bunkered quantities and quality data for the years 2017 and 2018 concerning our operable fleet:



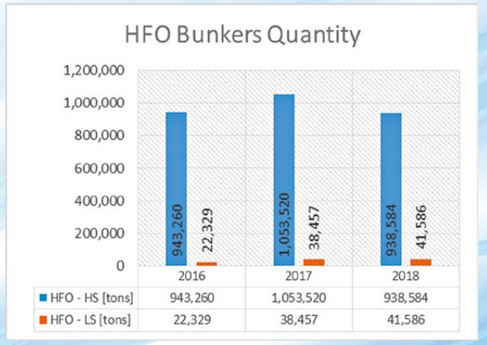
	2017	2018
Bunker Quantity	1,129,698	1,013,249
Sulfur	2.39%	2.43%

Fleet size and engine power within each year (including the four Danaos Bareboats).

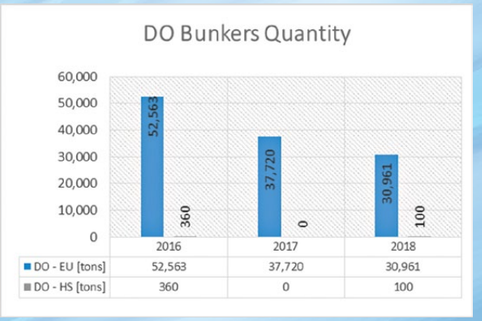


The fuel quantity delivered in 2018 based on our bunker delivery notes, presents a decrease of 10.3% compared to that of 2017. The above is in line with the low fuel consumption of the fleet as explained above. If we wish to make a qualitative analysis of the results based on the detailed graphs of bunkered quantities per fuel grade apposed here below, we see that the low sulphur fuel oil quantity bunkered is constantly increasing replacing both HFO and MGO quantities. This is attributed to the fact that even more areas and port import Sulphur regulations restrictions. The weighted average sulphur content on the other hand has slightly increased.

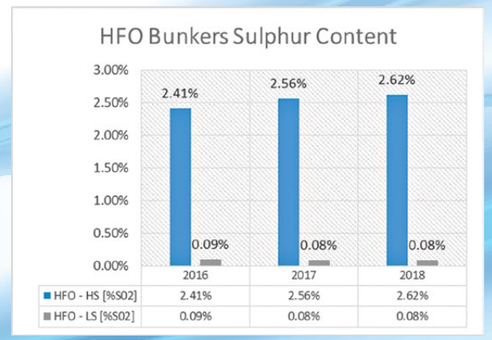
Below is the break-down of the bunkered quantities and the corresponding weighted average sulphur content for each grade.



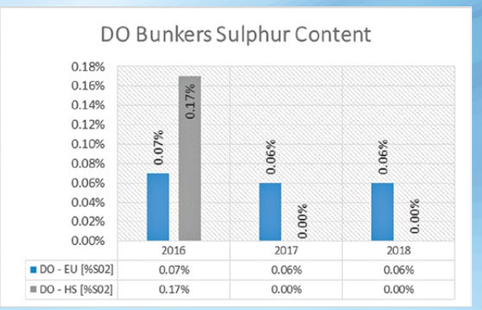
	2016	2017	2018
HFO - HS [tons]	943,260	1,053,520	938,584
HFO - LS [tons]	22,329	38,457	41,586



	2016	2017	2018
DO - EU [tons]	52,563	37,720	30,961
DO - HS [tons]	360	0	100



	2016	2017	2018
HFO - HS [%SO2]	2.41%	2.56%	2.62%
HFO - LS [%SO2]	0.09%	0.08%	0.08%



	2016	2017	2018
DO - EU [%SO2]	0.07%	0.06%	0.06%
DO - HS [%SO2]	0.17%	0.00%	0.00%

ENERGY EFFICIENCY OPERATING INDEX (EEOI)

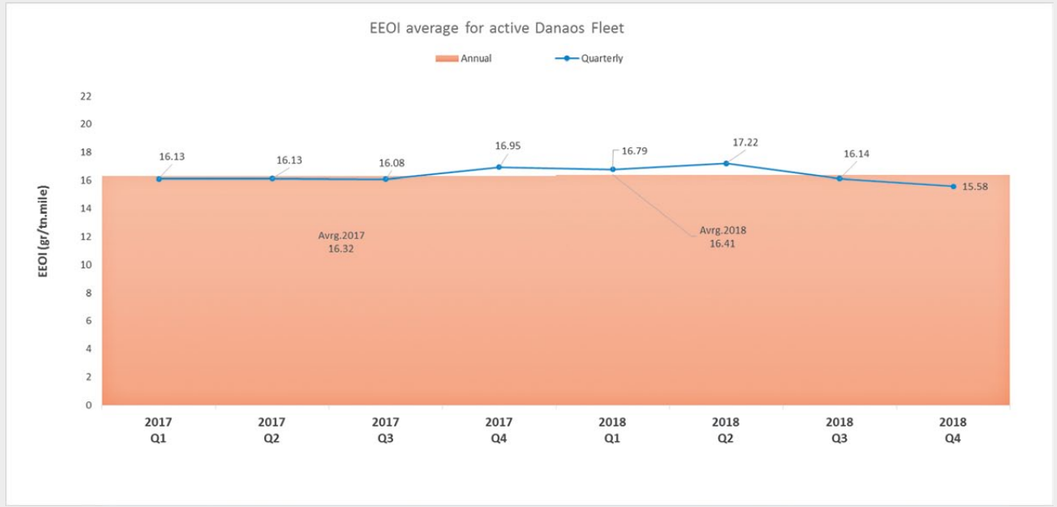
Developed by the IMO as per MEPC.1 Circ.684, the EEOI index calculates the amount of CO_2 emitted per ton/unit/TEU of cargo transported per nautical mile. CO_2 output per cargo can be used as an indicator of a vessel's fuel efficiency. This only reports CO_2 emission as a result of fuel combustion.

Industry standardization and verification of CO_2 data is a prerequisite in order to enable fair, reliable measurements of CO_2 performance and to enable CO_2 benchmarking with competition.

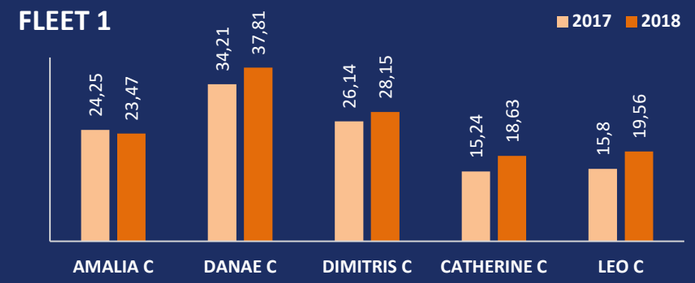
Danaos has achieved significant improvement in CO_2 emissions production since 2012, mainly due to the consistent efforts in improving vessels energy efficiency and reducing fuel costs.

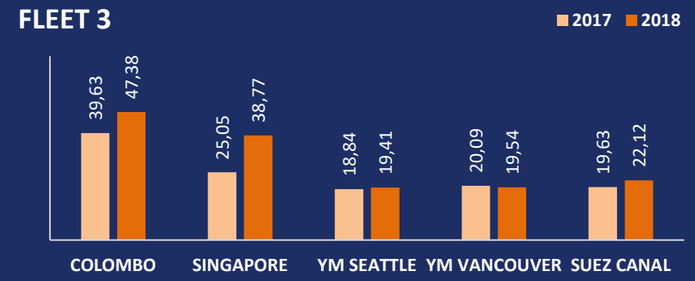
The above improvements have been driven by the results of a thorough technical research initiated in 2008 and have been realized within a controlled and structured framework, without compromising the vessels' safety and utilization.

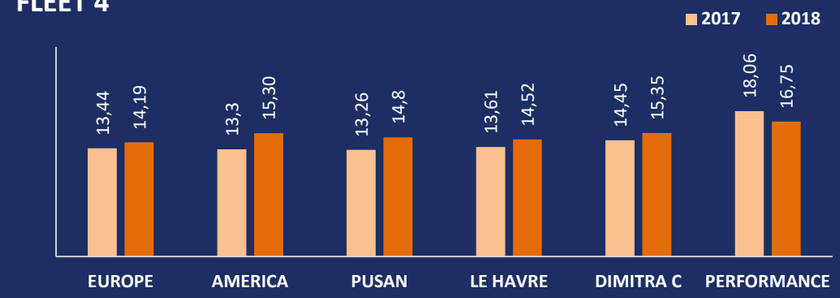
In the below graph, the Danaos fleet EEOI average for the years 2017-2018 can be seen.

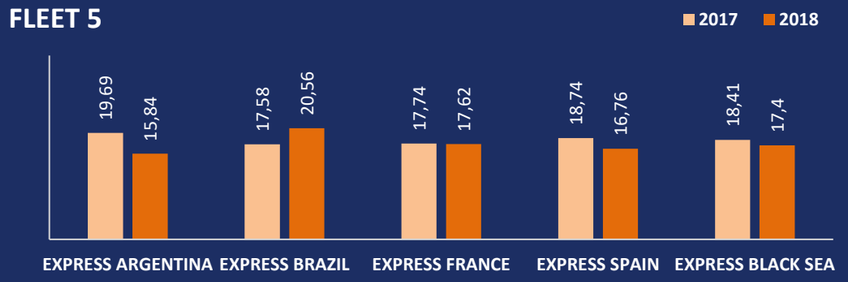


The EEOI figures for all company vessels are depicted in these graphs:

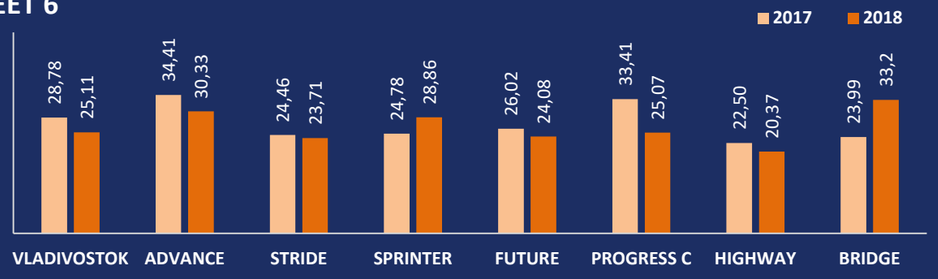




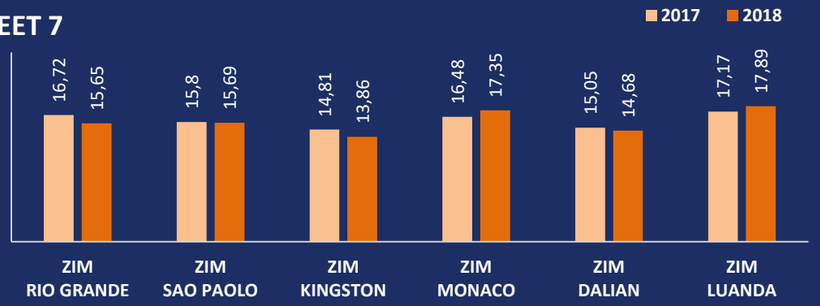




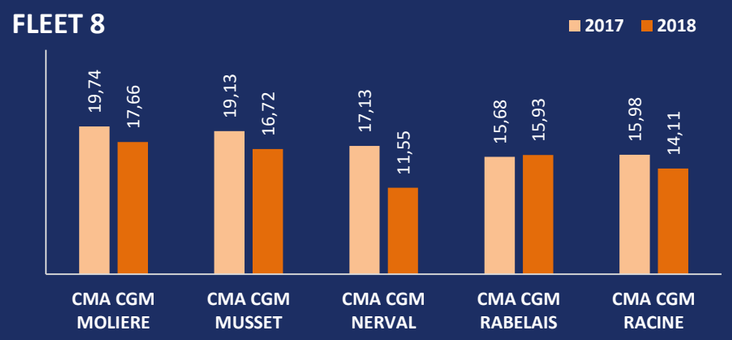
FLEET 6



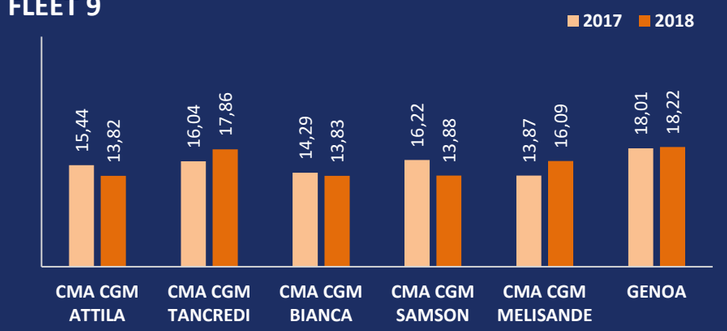
FLEET 7



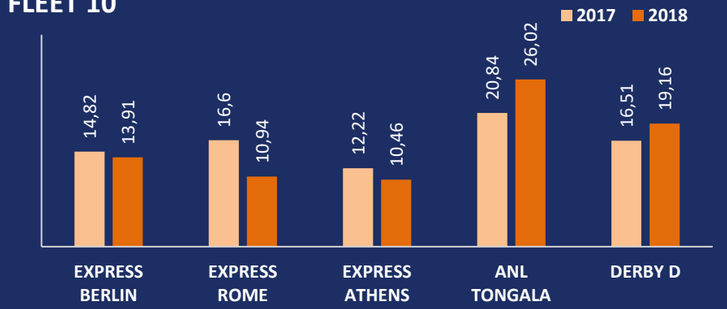
FLEET 8



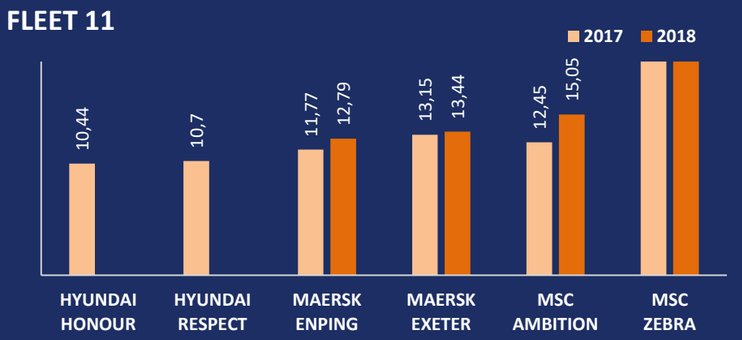
FLEET 9



FLEET 10



FLEET 11



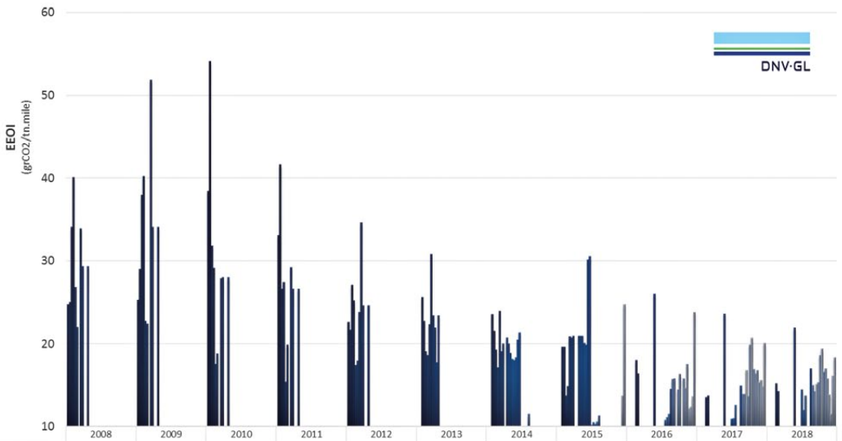
EEOI FOR THE DANAOS FLEET (YEARS 2017-2018)

The average EEOI has increased by 0.6% for 2018. This is mainly attributed to the fact that both draft & speed have slightly decreased, leading to less fuel consumption, which along with the less cargo carried and distance, reduced the ton*miles index but not proportionally to the fuel consumption. As a general observation, the operation in lighter drafts increased in 2018 compared to 2017. As a result, the fleet's average energy efficiency footprint was only slightly higher whrn compared with the previous year. Within 2018, a total of 17 vessels were drydocked, which contributed significantly to the improved performance and consumption of less fuel.

When it comes to each vessel's individual assessment, mixing trends have been observed either upward or downward. Detailed performance analysis and comparison between 2017 & 2018 is completed for each of the company's vessels within the first quarter of every year and results are updated in the SEEMP manual.

We also incorporated, a calculation tool, to measure EEOI through the vessels' daily telegrams in our Danaos Enterprise software back in 2008. Since 2008, we have voluntarily enrolled nine (9) of our vessels in the DNV-GL "CO2 Index" project, monitoring their performance and CO2 emissions. Within 2014, we have registered another ten (10) vessels from the Danaos fleet in the project, while the same was done in 2015, raising the total number of enrolled vessels to nineteen (19). At the end of 2016 we count twenty (20) vessels having an Energy Efficiency Operational Indicator Certificate issued by DNVGL. Within 2017 two of our 13100s that were enrolled in the scheme, were chartered as bareboats, and thereafter were replaced by another two vessels of the Danaos fleet that have been registered accordingly, receiving EEOI certification. As a result, the total number of the vessels participating in the scheme remains unchanged for both years 2017 and 2018. EEOI certificates are renewed within the first quarter of every year, where specific sets of data are sent to DNVGL, evaluated and discussed with Danaos in order to produce the EEOI values.

DANAOS CERTIFIED CO_2 INDEX BY DNV-GL FOR YEARS 2008-2018



Elbe	24.70	25.30	38.40	33.10	22.60						
Komodo	25.00	29.00	54.10	41.60	21.60						
ANL Tongala	34.10	37.90	31.80	26.60	27.10	25.60	23.50	19.60			
Derby D	40.10	40.20	29.10	27.40	25.20	22.70	21.50	19.60			
Europe	26.80	22.70	17.50	15.40	17.40	19.10	19.30	13.70	18.00	13.50	15.20
America	22.00	22.40	18.80	19.90	17.90	18.60	17.10	14.80	16.40	13.70	14.20
YM Vancouver					23.80	22.30	23.90	20.80			
Vladivostok	33.90	51.90	27.90	29.20	34.60	30.80	19.10	20.70			
Advance	29.30	34.10	28.00	26.60	24.60	23.40	20.00	20.90			
Commodore						21.90					
Federal						17.70	20.70				
Advance	29.30	34.10	28.00	26.60	24.60	23.40	20.00	20.90			
Future							18.90	20.90			
Bridge							18.10	20.90			
Highway							18.00	20.10	26.00	23.60	21.90
Progress C							18.30	19.90			
Sprinter							20.50	30.10			
Stride							21.30	30.50			
MSC Ambition							9.60	10.20	10.00	10.90	14.40
Maersk Enping							9.70	10.50	10.00	11.00	12.00
Maersk Exeter							10.00	10.30	10.80	12.60	13.70
Hyundai Honour							9.90	10.60	11.10		
Hyundai Respect							11.50	11.30	11.50		
CMA CGM Tancredi									14.50	14.90	17.00
CMA CGM Attila									15.70	13.90	15.00
CMA CGM Bianca									15.80	13.90	14.20
CMA CGM Samson										16.80	15.10
CMA CGM Melisande									14.40	13.60	15.30
CMA CGM Moliere									16.30	19.90	18.60
CMA CGM Musset										20.70	19.40
CMA CGM Nerval									15.80	16.90	16.60
CMA CGM Rabelais									14.60	16.40	17.00
CMA CGM Racine									17.50	16.80	15.80
Express Rome									12.20	15.30	13.80
Express Athens									12.40	15.60	11.50
Express Berlin								13.70	13.60	14.80	16.10
Express Black Sea								24.70	23.80	20.10	18.30

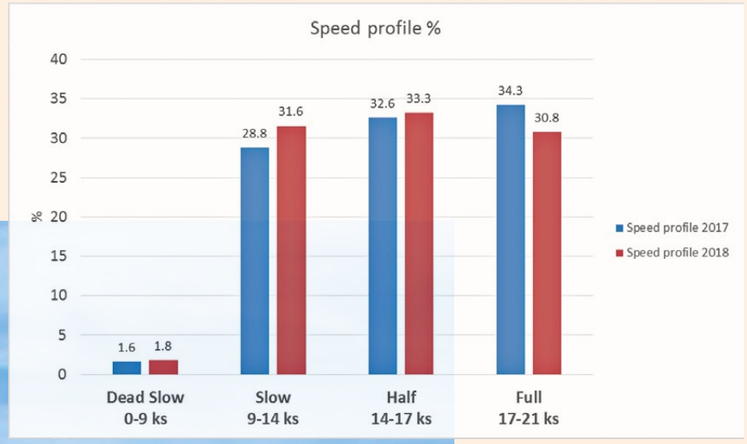
The science of today is the technology of tomorrow

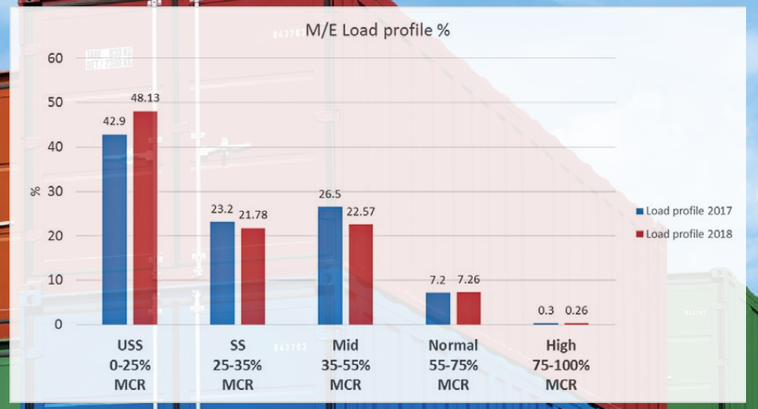
Edward Teller

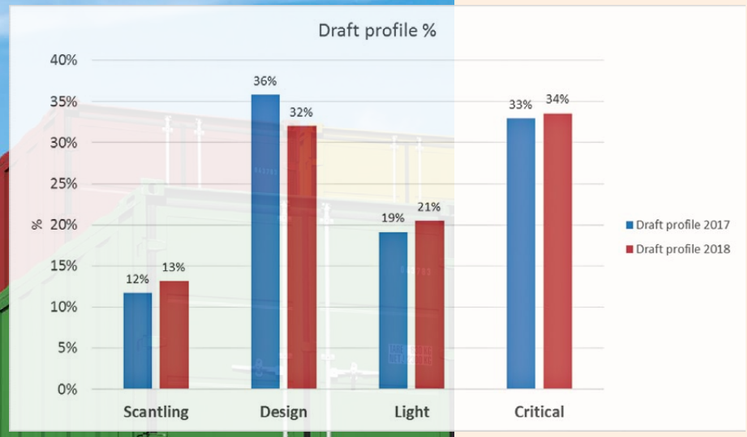
OUR FLEET'S OPERATIONAL PROFILE

(2017 VS 2018)

The figures indicate, that the ultra-super slow steaming (USS) activity has slightly increased within 2018, which is justified by the very marginal reduction in average speed profile. Operation in design draft range has decreased in 2018, while operation in all other draft categories has slightly increased.

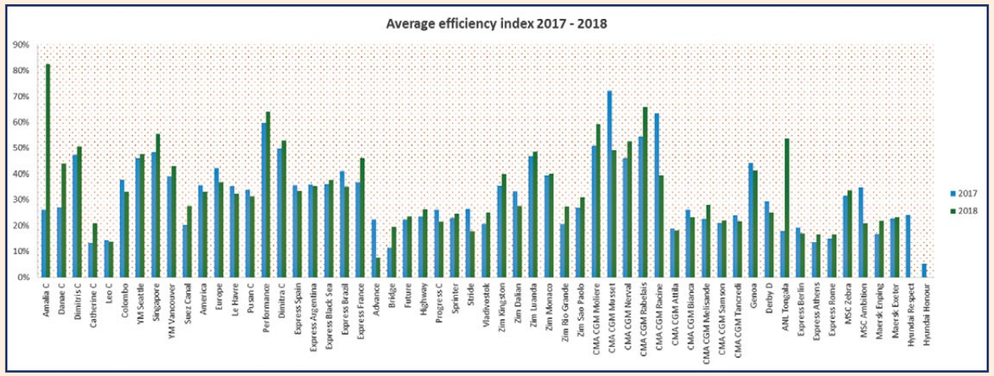






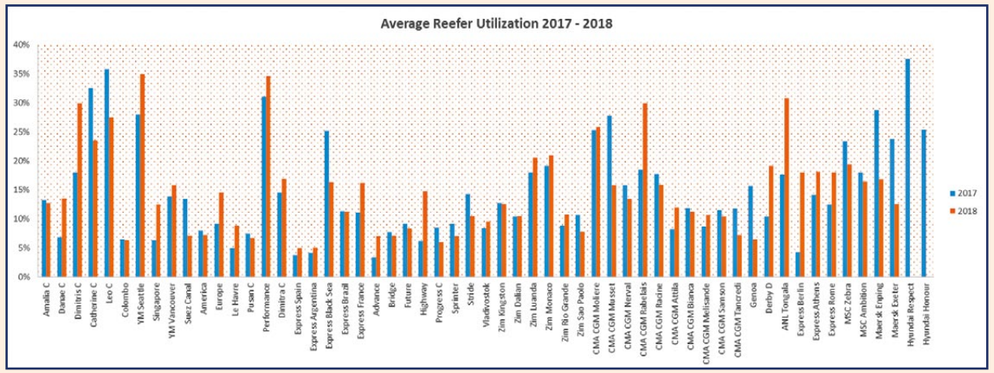
DANAOS ENERGY EFFICIENCY INDEX

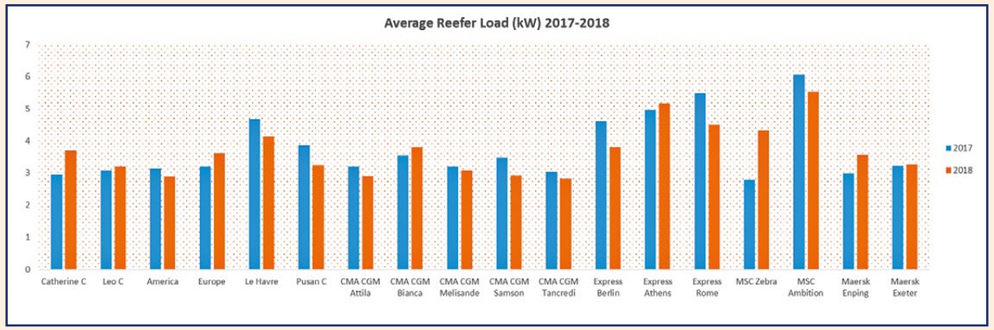
Danaos has designed energy management algorithms, which are incorporated in our WAVES analytics platform in order to achieve a close monitoring of vessels' energy performance. The efficiency index, designed by our R&D department, contains the metrics of quantifying the implementation of energy efficient measures and instructed practices onboard, as well as the metrics for assessing the embedding of energy awareness of Danaos' personnel onboard. The indicator in question is considered as the barometer of the company's' policy assimilation and provides a good assessment tool for identifying areas offered for further improvement. For the years 2017 and 2018, the average energy efficiency index, as calculated through Waves, for all company vessels, is apposed here below.



The average efficiency index for 2018 was 34% and slightly increased compared to 32% in the previous year. The above, is an indicator of continuous improvement, as well as, an implementation of the specific optimization measures and can be attributed to the fact that the approaches for energy saving are successfully implemented by our vessels in practice, making Danaos vessels more efficient & attractive.

The average reefer utilization for 2018 was 14.7% and remained steady compared to the previous year. The graphs of average reefer load and average reefer utilization for all company vessels are presented here below.

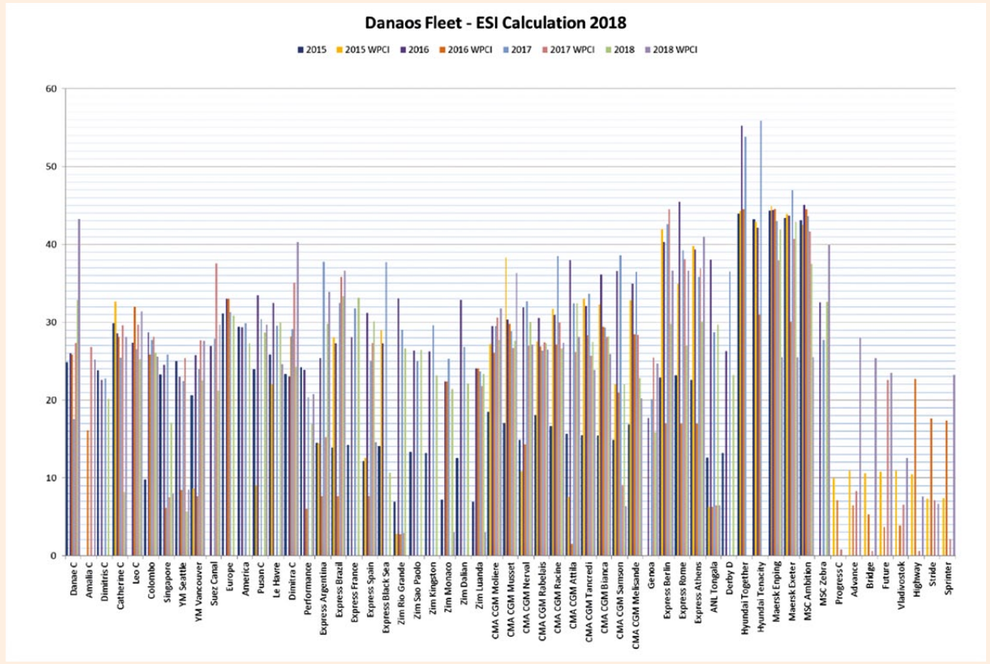




ENVIRONMENTAL SHIPPING INDEX (ESI)

Danaos was enrolled, on a voluntary basis, in the Environmental Ship Index (ESI) system, which is developed by the World Port Climate Initiative (WPCI) (http://esi.wpci.nl/Public/Home).

So far, 44 of our vessels have been officially enrolled on the WPCI ESI data base, excluding the 2 bareboat chartered, either by our charterers or directly by Danaos. However, ESI has been calculated for all our Fleet vessels built after 2000 (having a NO_X technical file) as it is considered an extra tool for evaluating our vessels' environmental performance and an instrument for contributing to our clients' sustainability policy. Below you can find the relevant graph containing all ESI scores for the past 4 years, from 2015 to 2018.



This project is a voluntary system designed to improve the environmental performance of sea going vessels and an instrument to visualize the environmental performance of ships regarding air pollutants and CO_2. It takes the NO_X and SO_X emissions directly into account and rewards documentation and management of energy efficiency, like EEOI, AMP installations and SO_X Scrubber installations. Any vessel can be enrolled either from her manager/owner or charterer. Her consumption, distance and bunkering data should be updated in their database every six months when the new ESI values are calculated and relevant certificates are produced. The ESI scores for a total of 46 vessels (equipped with a NO_X technical file) have been calculated by the Danaos R&D department based on the data available for the corresponding years (from 1/1-31/12) and are depicted in the graph above. The differences observed in some cases between Danaos' calculated ESI values and the ones in the WPCI web site, are owed to the different period that the calculation takes place.

PM is indirectly included because of its strong relationship to SO_X. Vessels with ESI indexes above a certain score (varying from port to port) are eligible to be granted, as a reward, a discount on port dues in more than 20 major ports worldwide. Vessels calling ECA areas therefore burning MGO or 0.1% ULSFO are highly rewarded, gaining high scores. Contrary to the above, the vessels calling non-ECA areas, are not likely to achieve a high score. The below table with ESI scores refer to the 44 vessels subscribed in the WPCI and their score is according to the WPCI web site and depending on the vessel, are valid for the mentioned period.

	2016	Score Validity	2017	Score Validity	2018	Score Validity
1	Hyundai Smart	01/01/2017 - 30/06/2017	Maersk Enping	01/01/2018 - 30/06/2018	Danae C	01/10/2018 - 31/03/2019
2	Hyundai Speed	01/01/2017 - 30/06/2017	Maersk Exeter	01/01/2018 - 30/06/2018	Amalia C	01/10/2018 - 31/03/2019
3	Hyundai Ambition	01/01/2017 - 30/06/2017	MSC Ambition	01/01/2018 - 30/06/2018	Catherine C	01/10/2018 - 31/03/2019
4	Hyundai Together	01/01/2017 - 30/06/2017	Progress C	01/10/2018 - 31/03/2018	Leo C	01/10/2018 - 31/03/2019
5	Hyundai Tenacity	01/01/2017 - 30/06/2017	Advance	01/10/2018 - 31/03/2018	Colombo	01/10/2018 - 31/03/2019
6	Hyundai Progress	01/10/2016 - 31/03/2017	Bridge	01/10/2018 - 31/03/2018	Singapore	01/10/2018 - 31/03/2019
7	Hyundai Advance	01/10/2016 - 31/03/2017	Future	01/10/2018 - 31/03/2018	YM Seattle	01/10/2018 - 31/03/2019
8	Hyundai Bridge	01/10/2016 - 31/03/2017	Vladivostok	01/10/2018 - 31/03/2018	YM Vancouver	01/10/2018 - 31/03/2019
9	Hyundai Future	01/10/2016 - 31/03/2017	Highway	01/10/2018 - 31/03/2018	Suez Canal	01/01/2019 - 30/06/2019
10	Hyundai Vladivostok	01/10/2016 - 31/03/2017	Stride	01/10/2018 - 31/03/2018	Pusan C	01/01/2019 - 30/06/2019
11	Hyundai Highway	01/10/2016 - 31/03/2017	Sprinter	01/10/2018 - 31/03/2018	Le Havre	01/10/2018 - 31/03/2019
12	Hyundai Stride	01/10/2016 - 31/03/2017	Express Spain	01/01/2018 - 30/06/2018	Dimitra C	01/10/2018 - 31/03/2019
13	Hyundai Sprinter	01/10/2016 - 31/03/2017	Express Argentina	01/01/2018 - 30/06/2018	Performance	01/10/2018 - 31/03/2019
14	Express Spain	01/01/2017 - 30/06/2017	Express Brazil	01/01/2018 - 30/06/2018	Express Argentina	01/01/2019 - 30/06/2019
15	Express Argentina	01/01/2017 - 30/06/2017	Express Athens	01/01/2018 - 30/06/2018	Express Brazil	01/10/2018 - 31/03/2019
16	Express Brazil	01/01/2017 - 30/06/2017	Express Berlin	01/01/2018 - 30/06/2018	Express Spain	01/01/2019 - 30/06/2019
17	Express Athens	01/01/2017 - 30/06/2017	Express Rome	01/01/2018 - 30/06/2018	Zim Monaco	01/10/2018 - 31/03/2019
18	Express Berlin	01/01/2017 - 30/06/2017	CMA CGM Attila	01/01/2018 - 30/06/2018	Zim Luanda	01/10/2018 - 31/03/2019
19	Express Rome	01/01/2017 - 30/06/2017	CMA CGM Bianca	01/01/2018 - 30/06/2018	CMA CGM Moliere	01/10/2018 - 31/03/2019
20	CMA CGM Attila	01/01/2017 - 30/06/2017	CMA CGM Samson	01/01/2018 - 30/06/2018	CMA CGM Musset	01/10/2018 - 31/03/2019
21	CMA CGM Bianca	01/01/2017 - 30/06/2017	CMA CGM Tancredi	01/01/2018 - 30/06/2018	CMA CGM Nerval	01/10/2018 - 31/03/2019
22	CMA CGM Samson	01/01/2017 - 30/06/2017	CMA CGM Melisande	01/01/2018 - 30/06/2018	CMA CGM Rabelais	01/10/2018 - 31/03/2019
23	CMA CGM Tancredi	01/01/2017 - 30/06/2017	CMA CGM Moliere	01/10/2018 - 31/03/2018	CMA CGM Racine	01/10/2018 - 31/03/2019
24	CMA CGM Melisande	01/01/2017 - 30/06/2017	CMA CGM Musset	01/10/2018 - 31/03/2018	CMA CGM Attila	01/01/2019 - 30/06/2019
25	CMA CGM Moliere	01/10/2016 - 31/03/2017	CMA CGM Nerval	01/10/2018 - 31/03/2018	CMA CGM Tancredi	01/01/2019 - 30/06/2019
26	CMA CGM Musset	01/10/2016 - 31/03/2017	CMA CGM Rabelais	01/10/2018 - 31/03/2018	CMA CGM Bianca	01/01/2019 - 30/06/2019
27	CMA CGM Nerval	01/10/2016 - 31/03/2017	CMA CGM Racine	01/10/2018 - 31/03/2018	CMA CGM Samson	01/01/2019 - 30/06/2019
28	CMA CGM Rabelais	01/10/2016 - 31/03/2017	Danae C	01/10/2018 - 31/03/2018	CMA CGM Melisande	01/01/2019 - 30/06/2019
29	CMA CGM Racine	01/10/2016 - 31/03/2017	Lodestar	01/10/2018 - 31/03/2018	Genoa	01/01/2019 - 30/06/2019
30	Danae C	01/10/2016 - 31/03/2017	NYK Leo	01/10/2018 - 31/03/2018	Express Berlin	01/01/2019 - 30/06/2019
31	NYK Lodestar	01/10/2016 - 31/03/2017	Amalia C	01/10/2018 - 31/03/2018	Express Rome	01/01/2019 - 30/06/2019
32	NYK Leo	01/10/2016 - 31/03/2017	YM Seattle	01/10/2018 - 31/03/2018	Express Athens	01/01/2019 - 30/06/2019
33	YM Vancouver	01/10/2016 - 31/03/2017	YM Vancouver	01/10/2018 - 31/03/2018	ANL Tongala	01/10/2018 - 31/03/2019
34	Priority	01/10/2016 - 31/03/2017	Priority	01/10/2018 - 31/03/2018	Maersk Enping	01/01/2019 - 30/06/2019
35	Performance	01/10/2016 - 31/03/2017	Genoa	01/01/2018 - 30/06/2018	Maersk Exeter	01/01/2019 - 30/06/2019
36	Zim Luanda	01/10/2016 - 31/03/2017	Zim Luanda	01/10/2018 - 31/03/2018	MSC Ambition	01/01/2019 - 30/06/2019
37	Zim Monaco	01/10/2016 - 31/03/2017	Zim Rio Grande	01/10/2018 - 31/03/2018	MSC Zebra	01/01/2019 - 30/06/2019
38	Zim Rio Grande	01/10/2016 - 31/03/2017	ANL Tongala	01/10/2018 - 31/03/2018	Bridge	01/10/2018 - 31/03/2019
39	Europe	01/01/2017 - 30/06/2017	Suez Canal	01/01/2018 - 30/06/2018	Advance	01/10/2018 - 31/03/2019
40			Colombo	01/10/2018 - 31/03/2018	Future	01/10/2018 - 31/03/2019
41			Singapore	01/10/2018 - 31/03/2018	Vladivostok	01/10/2018 - 31/03/2019
42					Highway	01/10/2018 - 31/03/2019
43					Stride	01/10/2018 - 31/03/2019
44					Sprinter	01/10/2018 - 31/03/2019

Danae C has an ESI score of 43.3, which is the highest among Danaos' registered vessels according to WPCI's website. She has been fitted with AMP within 2017, thus her score has improved.

SOx
4.0

NOx
24.32

CO2
5

OPS
10

ESI
TOTAL SCORE
43.3

This publication is designed, prepared and edited by the Danaos R&D Dept.

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