



CASE STUDY: DANAOS CONTAINERSHIPS

# DANAOS CONTAINERSHIPS

## EFFICIENCY DELIVERS MARKETABILITY

Distinguishing a vessel with energy efficiency retrofits can increase its prospects of being hired in the current container market. Danaos, one of the largest independent containership owners in the world, is ensuring its profitability by exploring a variety of energy efficiency improvement measures.

Danaos has a fleet of 56 vessels representing over 3.8 million deadweight tonnage (DWT). It has worked consistently with shipyards, classification societies, and charterers to ensure that its vessels incorporate state-of-the-art design, making its fleet efficient in both voyage speed and loading capability.

### OPPORTUNITY

The combination of low freight rates and oversupply of vessels means that independent container companies are competing for customers. Applying energy efficiency technologies to make their vessels more reliable and affordable to operate is an effective way for container owners to set themselves apart from their competitors and increase their likelihood of getting chartered.

### SOLUTION

Danaos has applied retrofits to the majority of its fleet (Figure

2) by systemically assessing the technical and financial opportunities for each vessel. Danaos states that the most important part of its retrofit process is its data acquisition system. This system is essential to accurately observe the actual fuel consumption savings associated with these technologies. This is very important for Danaos since it has to convince its investors of the financial value of making retrofit investments, which can be challenging if the investors initially perceive the retrofits only benefiting the charterers. Danaos's data acquisition system and similar innovations earned it the Lloyd's List Intelligence Big Data Award 2015, data dating back for a significant period of time.

In addition to the data acquisition system, Danaos applied multiple energy efficiency technologies to its vessels. It conducted trim optimisation tests to determine the optimum trim angles by investigating a range of normal operating conditions for each vessel. The results from these tests were used to create a map that the company uses to ensure the

vessels are always trimmed to the optimum angle. Danaos has installed MAN Diesel & Turbo's Kappel propellers, propeller boss cap fins and bulbous bow (Figure 1a). In addition to this, it applied antifouling paint to the hulls, and de-rated many of the vessels' engines to provide a better match between the operational and optimisation speed.

Danaos is committed to improving the energy efficiency of its fleet and has taken measures on all of its vessels. The approach it takes to implementing and financing these improvements depends on the length of each vessel's charter period. For example, when the time charter is due to expire in 3–5 years both Danaos and its charterer benefit from retrofit technologies. They would therefore share the investment between them. Danaos has explored doing this by including a “shared savings retrofit clause” into its existing charter party agreement. This clause shortens the repayment period, shares any potential risk, and enables both companies to benefit in the short term.

## RESULTS

By conducting these retrofits, Danaos made its vessels more competitive in a difficult market. The company instigated these retrofits when the bunker price and number of vessels in the market was high, which created a demand for efficiency. Despite the drop in bunker prices, the market is still oversaturated. Danaos therefore still sees the importance of energy efficiency in order to make its vessels more attractive and employable. It also finds that now is a cost-effective time to conduct these retrofits since freight rates are lower, which means there is less of an opportunity cost of taking the vessels off-hire. Finally, as an established and trusted part of the shipping community, Danaos is proud to demonstrate its commitment to creating a healthy and sustainable environment.

Figure 2: Danaos Container Vessel



Figure 1a: MAN Diesel & Turbo propeller modification

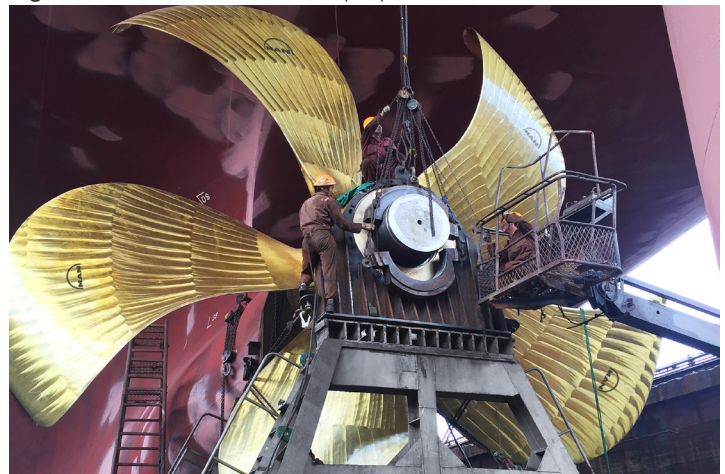
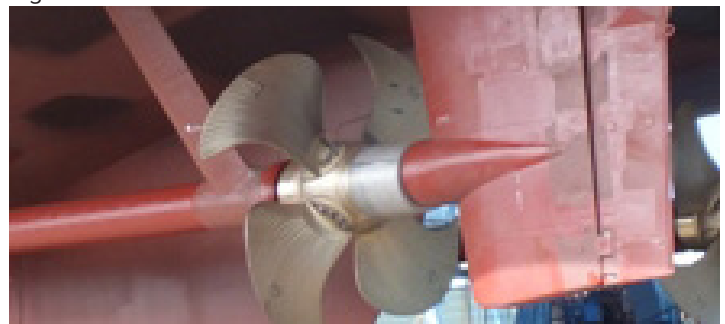


Figure 1b: MAN Diesel & Turbo rudder bulb



## About Carbon War Room

Carbon War Room (CWR) was founded in 2009 as a global nonprofit by Sir Richard Branson and a group of like-minded entrepreneurs. It intervenes in markets to accelerate the adoption of business solutions that reduce carbon emissions at gigaton scale and advance the low-carbon economy. CWR merged with Rocky Mountain Institute (RMI) in 2014 and now operates as an RMI business unit. The combined organization engages businesses, communities, institutions, and entrepreneurs to transform global energy use to create a clean, prosperous, and secure future. The combined organization has offices in Basalt and Boulder, Colorado; New York City; Washington, D.C.; and Beijing.

## GET INVOLVED

Shipping Efficiency drives the shipping industry toward a profitable, low-carbon future by addressing the market barriers to the adoption of energy efficiency solutions.

Learn more: [www.shippingefficiency.org](http://www.shippingefficiency.org) or [www.rmi.org/shipping](http://www.rmi.org/shipping) or contact us at [shippingop@carbonwarroom.com](mailto:shippingop@carbonwarroom.com)