To extend or end a ship's life?

GREEN MARINE (HTTPS://WWW.OFFSHORE-ENERGY.BIZ/TOPIC/GREEN-MARINE/)

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Illustration; Image by Offshore Energy

Exiting and revolutionary designs of new ships are hitting the headlines. Ammonia-ready, hydrogen-ready, or even nuclear-powered ships fitted with air-lubrication systems and rotor sails are coming to replace the existing fleet. The ultimate goal is to decarbonize the shipping industry with innovative ship designs, alternative fuels, and smart, fuel-saving technological solutions.

Of course, 'ready' means that they will have the capability to be retrofitted once these fuels become commercially and widely available, which might take a while.

Indeed, a large portion of the fleet will likely need to be replaced with newbuilds to meet the ever more stringent environmental regulations from the IMO, including those set to enter into force in 2023 covering ships' **carbon intensity indicators** and **energy efficiency indexes**. Because for some of the existing ships the business case for the installation of energy-saving solutions is rather poor.

However, before those ships are sent for demolition there are several things that need to be considered. The newbuilding vessels set to join the fleet in the upcoming years will probably be zero-emission ships once in operation. But what about their construction process?

Comprehensive data about the impact of ships' construction on the environment is rather difficult to obtain as this type of research is still under development.

A recent academic paper titled (https://www.researchgate.net/publication/280313109_Assessing_Environmental_Impacts_of_Ships_from_a_Life_Cycle_Perspective)"*Assessing Environmental Impacts of Ships from a Life Cycle Perspective*" by **Stefanos Chatzinkolaou and Nikolaos P. Ventikos** provides insights into the environmental impact of ships from a life cycle perspective. The study is part of a wider work aimed at developing a comprehensive framework for conducting environmental assessments of the shipping industry's air emissions from a life cycle perspective.

This basically covers the extraction of resources and raw material production, through transportation, assembly, operational life, up to the recycling and final disposal of wastes.

The ship as a system is viewed as a series of sub-systems and with regard to air emissions two subsystems (out of eight) were qualified as important throughout the life cycle: namely the hull subsystem, and the machinery subsystem.

It is acknowledged that during a ship's life cycle (20-25 years) various developments (e.g. emerging technology, policy and market progress) may drastically modify the environmental footprint of the ship.

Nevertheless, a case study of the hull subsystem of a Panamax oil tanker (75,000 tonnes of dwt), conducted as part of the research, showed that "*shipbuilding has 40% impact, recycling phases are responsible for 35 and 25 percent respectively*, *and steel production process under the scope of shipbuilding alone is responsible for nearly 90% of the total CO2 emissions.*"

Furthermore, one should also consider that a great majority of the global tonnage is still dismantled in beaching yards in South Asia which have poor working conditions and safety standards often resulting in injuries, air pollution, and toxic spills into the environment.

According to data from the **NGO Shipbreaking Platform**, 763 ocean-going commercial ships and floating offshore units were sold to the scrap yards in 2021. Of these, **583** of the largest tankers, bulkers, floating platforms, cargo- and passenger ships ended up on the beaches of Bangladesh,

India, and Pakistan.

There has been some progress in pushing for green recycling of ships in line with the Hong Kong Convention, but, the global yard capacity to meet those requirements has been rather low.

Therefore, the environmental impact of ending a ship's life largely depends on the yard the owner picks. However, poor shipbreaking practices are overwhelmingly predominant in the sector.

"It is clear from the evidence that repairing and extending the life of (mid-sized, vintage) ships is more environmentally friendly than building a new one. The sooner this 'uncomfortable truth' is accepted, the better," Dr. **Anand M. Hiremath**, Chief Sustainability Officer of GMS, said in a comment (https://www.gmsinc.net/article/extending-the-life-of-a-ship-bad-for-the-environment

Uncomfortable or not, the shipping industry, like other industrial sectors, vowing to protect the environment by becoming net zero by 2050, is at the risk of doing more damage than good as it favors the 'business case' over the well-to-wake assessment and the true impact of its business on the environment.

The same argument stands for **carbon offsets**: basically financing environmental projects by buying carbon credits to offset emissions. These practices have been on the receiving end of a lot of criticism as they enable industry players to avoid concrete emission reduction projects and changing their business models by writing fat checks.

Ultimately, the industry needs to make sure that switching ships to battery power would not endanger a population's livelihood by over-mining for rare earth metals in a certain part of the world.

The answer lies in finding ways to repurpose the existing assets and extending their lives, and recovering resources from the discarded assets in an efficient way. By looking at the entire picture and making sure **sustainability** is attained across the board, the industry can avoid going from a frying pan into a fire.