

**FEASIBILITY STUDY ON WASTE HEAT RECOVERY
FROM SHIP MAIN ENGINES USING ABSORPTION
CHILLERS: A CASE STUDY BASED ON HAMILTON
AND SARYU SHIP CLASSES**

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Abstract

With the growing environmental concerns and the emission regulations already in place, as well as upcoming regulations in the future, there is a need to reduce emissions from marine vessels. Waste heat recovery is a crucial and fundamental issue in energy management related to improving energy efficiency, saving fuel, and reducing greenhouse gas emissions.

The maritime industry is essential to the massive global movement of people and goods. Nonetheless, it is acknowledged that the maritime industry is responsible for 3% of the world's greenhouse gas emissions. The engine efficiencies of the modern marine ships are in the range of 30-45%, highlighting that 70-55% of the fuel energy is discharged as waste heat to the surrounding atmosphere by the engine cooling system and the exhaust system. Most of the time, energy efficiency and the reduction of environmental pollutants have not been taken into consideration in order to achieve the cruise's reliability and safety. The scope and the use of maritime transportation are expanding rapidly around the clock.

The goal of this study was to comprehend how waste heat is recovered from main engine exhaust fumes. It was observed throughout the literature research that the maritime industry has not yet adopted waste heat recovery techniques because of a number of obstacles. A few cruising ships are equipped with absorption chillers, a type of system that can handle the cooling demand on board.

Therefore, by considering Hamilton class and Saryu class ships it was discovered that the heat which can be recovered from exhaust gases of these classes of ship is more than enough to cater the cooling load of respective ship class. Furthermore, it was noted that at higher RPMs, the energy collected was more than sufficient to operate the cooling plant and provide cooling for more various components

In conclusion, it is recognized that the marine industry has very low energy efficiency and that not much effort has been made to date to address this issue through corrective action. Therefore, absorption cooling technology can be used to recover

energy from the marine sector and reduce greenhouse gas emissions, as demonstrated by this thesis.

Key Words: Diesel Engines, Exhaust Heat Recovery, Absorption Chillers, Maritime Transportation, Greenhouse Gases

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Environment pollution is the most neglected and least prioritized component but should be the most important component when it comes to the chasing the hunger of energy. Therefore, I would like to dedicate this thesis for the good health and the wellbeing of the living, nonliving, visible, invisible creature and the planet earth.

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Let's step forward for a better world with technology, clean environment and clear vision.

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