

## Thermal and hydraulic optimization and sensitivity analysis of Plate Heat Exchangers (PHE) design for marine ORC systems

### Description:

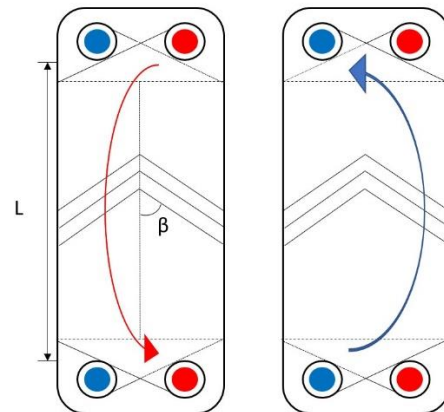
Waste Heat Recovery (WHR) Organic Rankine Cycle (ORC) technologies are gaining increasing attention as a promising solution for decarbonizing the shipping sector and reducing fuel consumption in marine engines. Among the key components of ORC systems, heat exchangers play a critical role in system efficiency, especially due to their compactness and effectiveness. Since they account for 70–80% of the total investment cost and occupy significant volume compared to other system components, optimizing the design of Plate Heat Exchangers (PHE) is essential for improving the overall performance and cost-effectiveness of marine ORC systems.

### The following work packages (WPs) form the content and tasks of the thesis:

**WP1:** Conduct a comprehensive literature review on modeling and optimization approaches for PHE.

**WP2:** Improve the existing PHE model using the LMTD method developed in MATLAB®. The goal is to determine optimal design parameters that maximize overall heat transfer coefficients while minimizing pressure drops. Optimization will be carried out using a heuristic algorithm, integrated into an existing ORC operation optimization code.

**WP3:** Sensitivity analysis with respect to fixed geometric parameters, flow arrangement and other indicators will be conducted. Optimal PHE design to be determined.



### Requirements:

- Motivation, creativity and structured working
- Experience in modelling of thermodynamic systems (e.g. assignments, internship, bachelor/semester thesis)
- Programming skills (MATLAB® software)
- Good knowledge of English

Please, send your application with a **Curriculum Vitae** to

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A short motivation letter (1-page maximum) would be highly appreciated, but it is not mandatory for the consideration of your application.