

## Topic proposal for Master's thesis

# Developing a business case for the application of wind powered wing-sail propulsion systems on commercial ships

## Introduction

One of the largest challenges we are currently facing is the climate change. Even though ships are an energetically efficient means of transportation, they still have a significant share in overall greenhouse gas emission. Hence, the maritime industry has a chance—and a responsibility—of contributing to reduce greenhouse gases.

We, the team from Becker Marine Systems, have taken on the challenge for several years now. By developing our energy saving device *Mewis Duct*<sup>®</sup> we were able to reduce the CO<sub>2</sub> emissions by more than five million tons—an achievement that we are very proud of. Still, we are always pushing forward to develop new energy efficient solutions. Now, we have a new technical solution for reducing greenhouse gas emission while providing an economical benefit—and you can help making it real!

## Technical Background

In cooperation with industrial partners, Becker has developed a wind powered propulsion system for ships that uses wing-sails. The system can be fitted on various different ship types. The wings are built from fibre-reinforced plastics and can be folded away for storage, to avoid overload or to pass height-restricted areas. The system is designed either to be the main propulsion system or to support a conventional propulsion system.

For now, we focused the development on technical aspects and we were able to prove a technical feasibility. However, due to the complexity of the system and the size of the components, a large effort for design and production is required which leads to high expected costs. Hence, our next step is to perform a comprehensive analysis of the economic aspects.

## Tasks

You will start by gathering information on the current state of developing. Then, you will conduct a thorough market analysis in coordination with our Sales department, considering different ship types, owners and operational profiles and evaluate the results to gain an understanding of the requirements of the market, taking into account different application scenarios.

In the main part of the thesis, you will use the results of the market study to develop a business case. It should take into consideration:

- A cost-benefit analysis for different application cases
- Estimation of the market potential for the most beneficial applications
- Environmental Impact



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- Risks in the development process
- Risks for the customers
- A comparison to other approaches

The business case should contain different options and give a recommendation for the direction of further development. Main goal of the work is to evaluate the economic feasibility of the concept considering requirements of the market, technical aspects and financial metrics.

For a more technical oriented thesis, you might also investigate the possibilities for standardisation and a modular approach of the system to reduce design effort for individual projects, hence, improving their economic feasibility.

Upon finishing your work, you get the opportunity to present your results to BMS stakeholders including the managing directors.

You will work in close coordination with our R&D, Sales and Design departments.

### Your Profile

- You have a sound knowledge in engineering and business economics.
- You have a general understanding of the stakeholders involved in the maritime industry and the physics of sailing.
- You are close to finalizing your master's degree in a subject covering economics and engineering like Engineering management, civil engineering, business management, maritime engineering or similar.
- You want to make a positive impact on the environment by helping to increase energy efficiency and to reduce the dependency on fossil fuels in the naval industry.
- You want your work to be commercially relevant and scientifically sound.
- You are fluent in English and willing to work in English.
- Good communication skills and teamwork capabilities are crucial.
- You are willing to make short travels if necessary.

### For further information contact

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### Note on confidentiality

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