

# D3.12 Demonstration Via Donau Push Boat (DEM)

Synergetics | Synergies for Green Transformation of Inland and Coastal Shipping

<b>GRANT AGREEMENT NO.</b>	101096809
<b>DURATION OF THE PROJECT</b>	42 months
<b>DELIVERABLE NUMBER</b>	D3.12 (DEM; PU)
<b>DELIVERABLE LEADER</b>	MARIN
<b>STATUS</b>	FINAL
<b>SUBMISSION DATE</b>	20-12-2024
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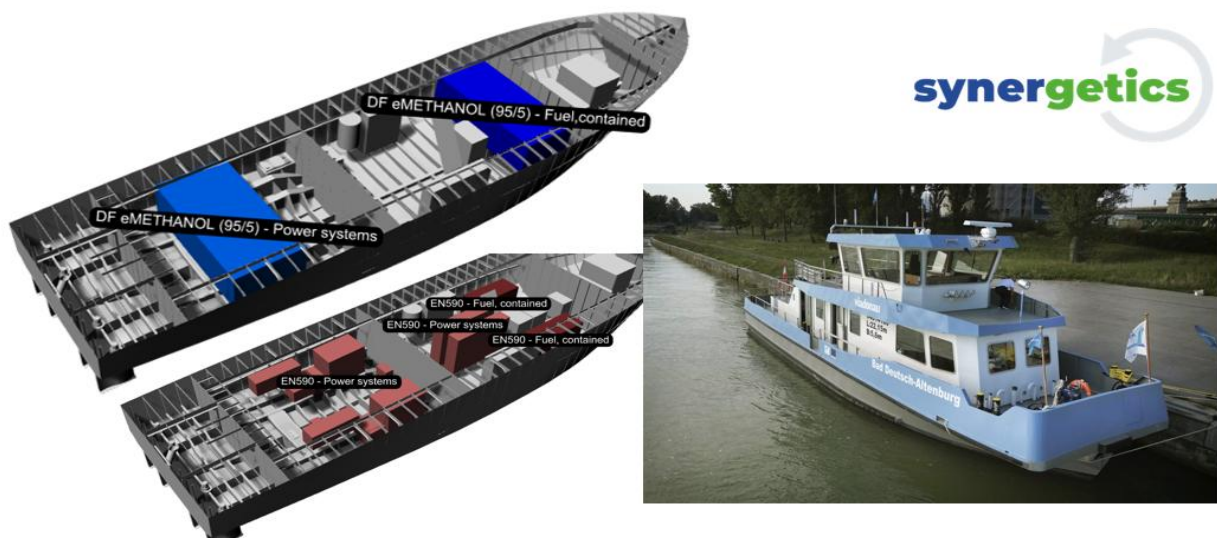
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## | D.3.12 Demonstration Via Donau Push Boat

Deliverable D3.12 is a deliverable of type “demonstrator, pilot, prototype” (DEM). This document provides additional information on the background, status and plans. A detailed report will be submitted in June 2025 with the deliverable D3.13 Evaluation report Via Donau push boat.

MARIN commenced the analysis of the optimal design of the power and energy systems for the vessel by identifying the operational requirements. This included an operational analysis to determine key tasks the ship would perform with distinct power demands over time. Four different Bunker Independent Operations (BIO) were identified to describe the operations the ship will carry out between two consecutive bunkering events. The power profiles of these BIOs were used to determine the endurance and power needs for technology selection. The selection process considered various technologies based on their volume, weight, cost, and emissions, revealing that some options, like battery-electric and fuel cell solutions, were not suitable. From the suitable solutions, it was chosen to continue with a concept that uses methanol as energy carrier. Consequently, a methanol fuel engine was chosen, offering the possibility of running on bio or synthetic fuels in the event that methanol is not available.



Bad Deutsch-Altenburg power and fuel system: diesel vs. methanol

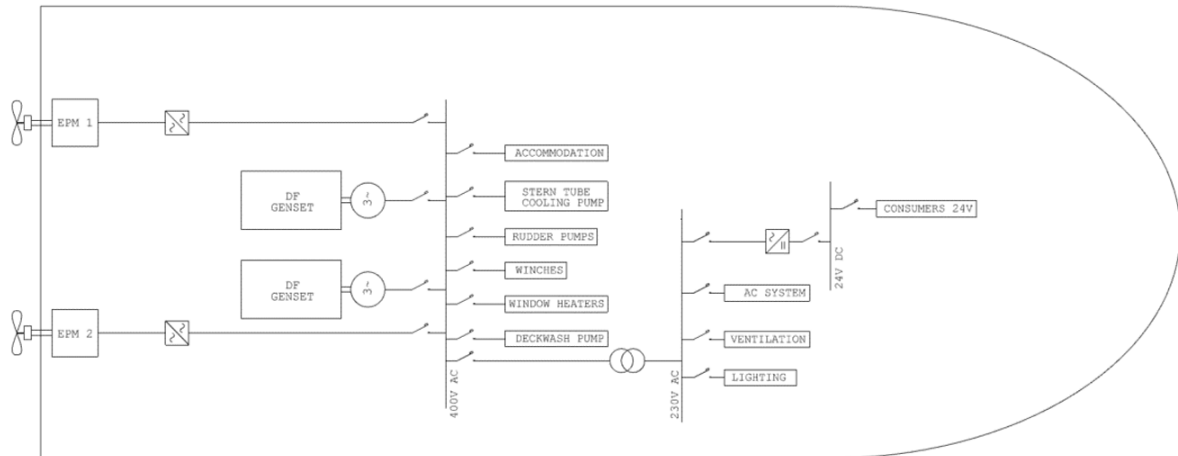
The forthcoming phase of the project will entail the refinement of the system through the evaluation of a number of different propulsion configurations, including methanol electric propulsion and direct propulsion. The objective is to determine the optimal configuration for the system. Once a decision has been made, the chosen configuration will be integrated into the vessel's 3D model, by using a simplified representation of the components. This will mark the beginning of the basic engineering for the power and energy systems.

The selected system will be modelled in MARIN's virtual Zero Emission Lab (v-ZEL), as well as the current diesel direct system. In the v-ZEL a comparison will be made between the two systems. The performance of both systems will be compared by fuel consumption, efficiency, and CO2 emissions for a complete mission.

A demonstration of the selected system will be physically demonstrated in MARIN's Zero Emission Lab. In this lab a scaled version of the system will be demonstrated. A number of scenarios will be simulated, to be able to experience the Via Donau push boat as if it was sailing on methanol.

Technical issues can be identified in the process of modelling and testing the system. This has the huge benefit of having lessons learned available, before the system is installed on board. The result is an integrated and optimised design of the power and energy system.





MARIN's Zero Emission Lab

