

Reducing exhaust emissions with LNG-ZERO concept

LNG-ZERO aims to develop the technology and strategy that are needed for reducing LNG exhaust emissions in order to contribute to a sustainable shipping industry. The project has been awarded a grant of EURO 4.4 million.

This project includes the development of a complete cycle for the application of an advanced LNG-ZERO concept. To do this successfully, the efforts of energy and infrastructure developers, end-users, and important suppliers and system integrators will be combined.

This will be achieved by a threefold strategy. The first strategy step will focus on capturing the carbon dioxide (CO₂). The second strategy step aims at reducing the methane slip and nitrogen oxide emissions significantly. The final strategy step brings the captured carbon either to shore for new applications, or directly offshore for permanent geological storage. Through this threefold strategy, we will achieve a massive reduction of greenhouse gases in the complete chain.

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MARIN will be involved in the last strategy step related to the offshore CO₂ transfer. By combining our expertise and state-of-the-art facilities (wave basins, software, simulators), we will assist Carbon Collectors (a startup which develops innovative solutions for the rapid reduction of GHG emissions to support the acceleration of the energy transition) in developing a service for collecting, transporting and permanently storing CO₂.

The first phase of the CO₂ transfer consists of the ship-to-ship CO₂ offloading to a carbon collector barge. This is followed by the CO₂ transfer phase, in which the CO₂ is transferred from the ship to the offshore geo-storage unit. The research objective of these phases will be to investigate the relevant parameters that determine the risks, safety and technology of the transfer of CO₂, and their relationship with the ship's capabilities and behaviour in various operational conditions: sheltered in ports or unsheltered offshore in open sea with various conditions such as wind, waves and currents.

