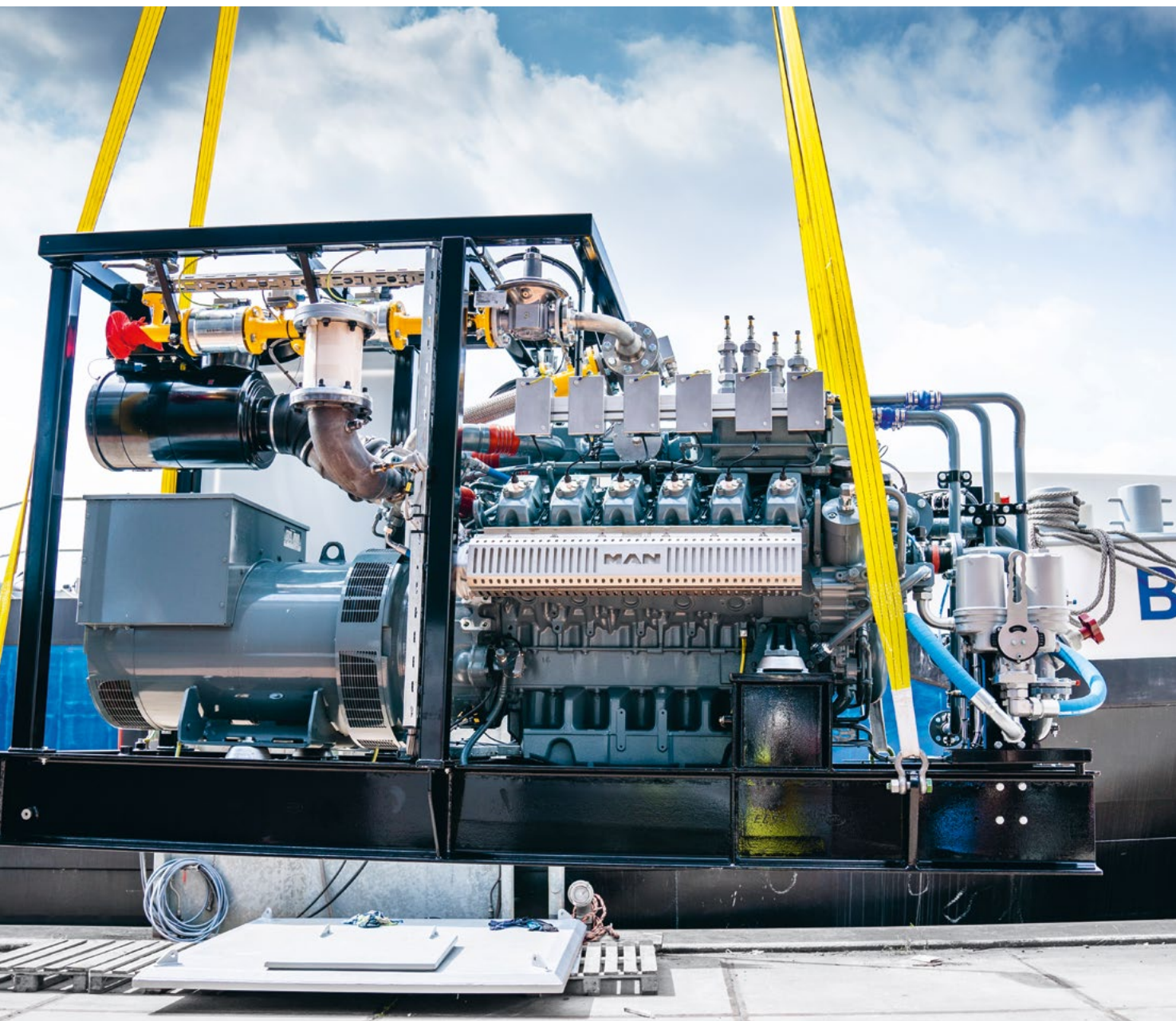


HEINZMANN - SUPPORTING THE ENERGY REVOLUTION

Parsifal project: Transporting goods on the water is becoming more climate-friendly



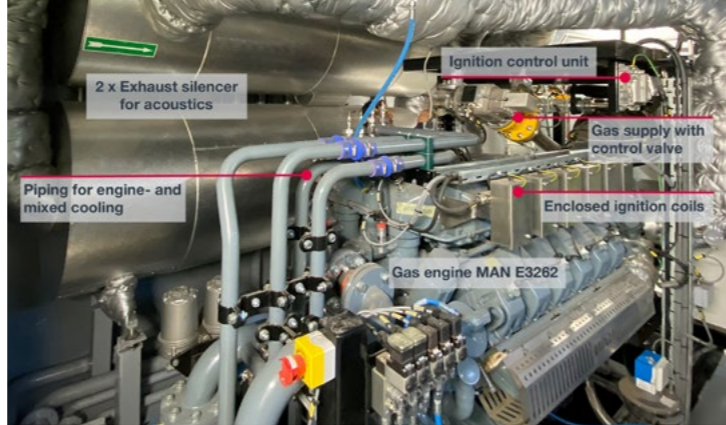
PARSIFAL PROJECT: Transporting goods on the water is becoming more climate-friendly

Reduced pollution and more climate-friendly: HEINZMANN and the Parsifal project will also help shape the future of international shipping with equipment from the Black Forest. By 2025, this innovative cooperation with MAN Engines and MAN Rollo will have equipped and launched 40 ships with low-emission drives.

Shipping is the backbone of global cargo handling. More than two thirds of total freight volumes worldwide are sent on ships via waterways in containers, as bulk goods or in tanks. Ship builders and shipping companies are aware of their responsibility and are actively looking for solutions to make the transport of goods more climate-friendly. One possible option: future-proof engines that combine high performance with low-emission operation. The Parsifal project implements this solution.

HEINZMANN, one of the few manufacturers of type approved gas engine control systems worldwide, has redefined the limits of what is technically feasible and shifted the standards together with engine specialist MAN Rollo B.V. and engine manufacturer MAN Engines. HEINZMANN Managing Director Gaudenz Pacher-Theinburg: "The Parsifal project highlights that we already have sophisticated technical solutions that immediately reduce CO₂ emissions in shipping without any loss of performance."

This low-emission and powerful gas-electric drive, developed in the Parsifal project, is based on two independent optimised MAN-V12 gas engines E3262, which are installed in MAN Rollo power units. They are operated with LNG (Liquefied Natural Gas) and have a significantly lower pollutant emissions than engines operated with heavy fuel oil or marine diesel oil. The engines developed in the Parsifal project not only satisfy the requirements of the exhaust emission standard Stage V, and are not only certified in accordance with the EU standard, but they afford much more. Project manager Peter Nieuwveld from MAN Rollo: "Carbon dioxide (CO₂) emissions are reduced by 25 percent, nitrogen oxide (NO_x) emissions are reduced by 80 percent, and there



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“Our solutions have the potential to achieve full CO₂ neutrality of the ships equipped with them.

Gaudenz Pacher-Theinburg,
HEINZMANN Managing Director

are no particulate matter (PM) or sulphur oxides (SO_x) in the exhaust.”

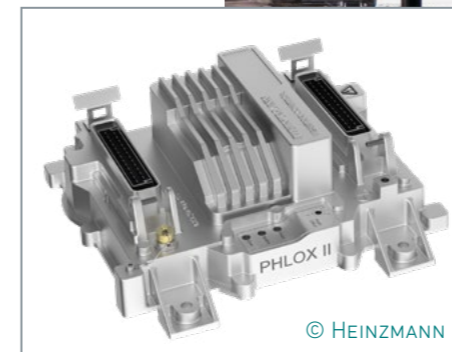
The reduction of emissions can only be achieved through the interaction of many components based on the outstanding engineering achievements of all partners in the Parsifal project. This is illustrated by HEINZMANN Project Manager Dominik Andre: "To meet the strict requirements of Stage V, very lean engine operation is necessary, which can get into the misfire limit when changing loads. But with a Venturi gas mixer specially adapted to the engine and its application, which responds to flow dynamics in the intake duct, the primary gas metering is directly and precisely aligned to the requirements of the engine

The technology developed in the Parsifal project has already proven its suitability for everyday use:

The MS "Helgoland", powered by a LNG dual-fuel engine that can be operated with diesel or optionally with gas, has been transporting people and goods between its home port of Cuxhaven and the German North Sea island since 2015. In 2018, the ship built in Germany receives the Blue Engel Award due to its low-emission motorisation. In the same year, the "Werkendam" dredging vessel is launched in Hardinxveld-Giesendam in the Netherlands. It is the first ship of its type to be operated with LNG.



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even in the event of large load changes." A dynamic adjustment of the ignition timing provides the engine more stability, and additional correction functions of the speed controller ensure the optimal fuel supply. "This means that the engine always operates within the stipulated speed range."

The quality of LNG is not as strictly specified as many other fuels. The innovative measurement and control technology must therefore be used to compensate for the fluctuations in fuel quality. As a result, engine management includes various operation-dependent functions within the speed control system, the mixture control system and the ignition system, as well as combustion monitoring systems.

The first ships with optimised LNG gas engines from the Parsifal project are already performing well in regular transport. But that doesn't mark the end of the Parsifal project. Irina Klier, Project Manager at MAN Engines: "National and international exhaust emission standards are further developed and the same applies to safety standards. We modify and test our engines regularly to ensure that they meet the changing requirements and are tailored to the needs of our customers." In addition, twelve new ships with low-emission motorisation are planned for 2022 alone within the Parsifal project. The cooperation between MAN Engines, MAN Rollo and HEINZMANN is based on trust, respect and

mutual appreciation. Irina Klier: "HEINZMANN is a strong partner with invaluable experience in all aspects of gas engines. This is not the first marine project we have tackled, so we can fall back on our shared experience." Peter Nieuwveld also emphasises reliability and praises the mentality of the machine specialist from the Black Forest: "HEINZMANN has the determination and focus that is essential for a project like this." For Gaudenz Pacher-Theinburg, Managing Director of HEINZMANN, the Parsifal project is part of a "very close and trusting partnership", which sets milestones and is able to bring "innovative and environmentally friendly propulsion and power generation solutions" to the market.

TECHNICAL DATA

- 2 independent MAN-V12 gas engines, type E3262
- 525 kW power per engine
- HEINZMANN mixture control system, speed control system, ignition system, monitoring and control measuring devices
- Certified according to EU Emission standard Stage V

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