

SchIBZ - the largest diesel fuelled fuel cell system for remote application

K. Leites¹, B. Wildrath², C. Walter³, S. Büchner⁴

¹thyssenkrupp Marine Systems, R&D, Hamburg, Germany

²Oel-Waerme-Institut gGmbH, Fuerl Cells, Herzogenrath, Germany

³sunfire GmbH, Stack Development, Dresden, Germany

⁴motion control and power electronics GmbH, Software Development, Dresden, Germany

With the project named **SchIBZ** thyssenkrupp Marine Systems (tkMS) and 6 partners from industry and research developed a fuel cell system, which is fuelled by standard road diesel oil.

Goal of this development is a clean and silent energy supply for decentralized or remote applications, where the fuel logistics has a significant cost impact. With a high electrical efficiency of about 50% it has an advantage of around 25% compared to diesel Generators in their optimum operation point. The emissions of CO₂ are accordingly lowered and others like NO_x, SO_x or PAH are nearly zero. Further fuel efficiency can be gained by heat recuperation from the exhaust, which is free of soot and keeps heat exchangers clean.

The System is modularized for easy adaption to different power demands. It consists of fuel cell modules of about 50kW power output, which can be stacked up to 400kW in one aggregate. They are connected to one fuel gas converter, which produces the fuel gas from diesel oil or natural gas. Other hydrocarbons will be possible with some adjustments.

The components are designed for an installation in containers, to build up deployable power plants in variable sizes. For further operation optimization the fuel cells can be combined with an energy storage, connected on DC level.

Actually tkMS is operating a 50kW hybrid plant which is containerized. The results will be used for a revision of the design for a better user experience.

The proposed paper will present the results of the first phase of the demonstrator tests as well as an outlook for a beneficial application.