A.P. Møller-Mærsk - Alfa Laval Aalborg - Hempel - MAN Diesel & Turbo - OSK-ShipTech - TORM -DBI - FORCE Technology - Teknologisk Institut - Aalborg Universitet - CBS - DTU - SDU - Propeller Control - Lyngsø Marine - Tetraplan - Transmar - Bureau Veritas - MacGregor - Claus Kruse -Vessel Performance Solutions

J. Lauritzen - Principia North - Automation Lab – SIMAC - Esvagt - A2SEA - Eltronic - LR Marine -Dansk Analyse - Lloyd's Register - Clean Combustion - Kosan Crisplant - Moving Energy - Haldor Topsøe - Danish Maritime - Controllable Pre-Swirl Fins - Dynamic propeller shaft speed control -Trailer Cat - Vessel Performance Decision Support - Monitoring & Performance - Gas Valve Train -

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Performance Solutions - J. Lauritzen - Principia N - Eltronic - LR Marine - Dansk Analyse - Lloyd's R Moving Energy - Haldor Topsøe - Danish Maritime shaft speed control - Trailer Cat - Vessel Performa Performance - Gas Valve Train - Multi fuel burner Shore based small scale LNG-LBG liquefaction ur steaming antifouling paint - Selective Catalytic Re – Servitization - A.P. Møller-Mærsk - Alfa Laval Aa ShipTech - TORM - DBI - FORCE Technology - Te DTU - SDU - Propeller Control - Lyngsø Marine -MacGregor - Claus Kruse - Vessel Performance S Automation Lab - SIMAC - Esvagt - A2SEA - Eltro Register - Clean Combustion - Kosan Crisplant - Marian

/lethane - Shore based small scale LNG-LBG ons - Slow steaming antifouling paint - Selective Biocides - Servitization - A.P. Møller-Mærsk -OSK-ShipTech - TORM - DBI - FORCE et - CBS - DTU - SDU - Propeller Control tas – MacGregor - Claus Kruse - Vessel

Project name:

Multi fuel burners for low emissions **Project participants:** Alfa Laval Aalborg DTU

Clean Combustion

Register - Clean Combustion - Kosan Crisplant - Moving Energy - Haidor Topsøe - Danish Maritime - Controllable Pre-Swirl Fins - Dynamic propeller shaft speed control - Trailer Cat - Vessel



Short project description

To develop a multi fuel burner capable of burning various gasseous and liquid fuels for marine applications fulfilling new environmental requirements for NOx emissions

To have this burner fit the existing geometry of the boiler if possible, or to define the geometry needed to have the emission requirements fulfilled.

Technology Readiness Level								
1	2	3	4	5	6	7	8	9
		Х						

Key features or key findings

What key features or findings would you like to highlight from your project work until now?

- 1. Which data is crucial for building up a numerical model
- 2. How to design measurements to verify the numerical model
- 3. First prototype suggestion shows difficulties in obtaining low NOx with present geometric limitations
- 4. Relevant fuels for the burner and wanted emission levels have been defined
- 5. A test rig for burners have been modified for in-flame studies and measuring probes have been constructed





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Project challenges and solutions

What challenges have the project team experienced and how has the team solved them?

- 1. To have different company cultures to work together different prioritations, re-scheduling of workpackages.
- 2. To determine which numerical models to be used, and the verification process
- 3. To define the project scope and future emission requirements. Based on demands on land today, and hope this will match the demand on marine market in the future





Why should you buy our solution?

What makes your solution the preferable one compared to other available solutions?

A burner capable of burning multiple fuels on the same platform and have low NOx emissions





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