MAN Energy Solutions

Press release

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Industry Consortium to Develop Medium-Speed, Ammonia-Fuelled Engine

MAN Energy Solutions starts 'AmmoniaMot' project with industry partners and research institutes

MAN Energy Solutions has begun the 'AmmoniaMot' (*Ammonia Engine* in German) project. Initiated by MAN with partners from industry and research institutes, it aims to define the steps necessary to produce a dual-fuel, medium-speed engine capable of running on diesel-fuel and ammonia.

Supported by the German Federal Ministry of Economics and Technology (BMWi), and due to run for three years from December 2020, project partners include the University of Munich, Neptun Ship Design, WTZ and Woodward L'Orange.

MAN Energy Solutions Dr. Alexander Knafl, Head of R&D, Four-Stroke Engineering, Augsburg, said: "MAN Energy Solutions views this project as closely aligned with its own strategy for developing sustainable technologies and welcomes the opportunity to work with external partners. For us, the path to decarbonising the maritime economy starts with fuel-decarbonisation and, in this context, ammonia is an excellent candidate in that it is carbon-free and eminently green when produced from renewable electricity sources."

Christian Kunkel, Head of Combustion Development, Four-Stroke R&D, MAN Energy Solutions, said: "With the DNV classification society forecasting approximately a 30% share of the maritime fuel market for ammonia by 2050, there is a general need for successful engine projects to display ammonia's viability. There is little doubt but that ammonia will become an important carbon-free energy carrier and thus will contribute to decarbonising the maritime sector. The AmmoniaMot project will deliver the base for future, commercial, four-stroke engines, which will be key in legitimising ammonia as a fuel and furthering the maritime energy transition."

MAN Energy Solutions Two-Stroke Business has already announced that it will deliver ammonia-fuelled engines by 2024.

Partner roles

The University of Munich (TUM) will employ a rapid-compression expansion machine to establish the fundamentals concerning the combustion of ammonia and will develop, together with MAN, the combustion models necesary for fast adaption of the technology to different engine sizes.

Neptun Ship Design (NSD) will analyse international regulations to ensure technical and safety requirements in a encapsulated, modularised fuel system. Such scalable components are a prerequisite for the introduction of ammonia engines in shipping. A prototype of the fuel system itself will be used on the test

engine at WTZ. NSD will work in close cooperation with MAN on a roadmap regarding which steps are necessary to use ammonia engines with all necessary ancillary systems in new ships and conversions.

WTZ is a specialist within the field of energy conversion and will utilise a high-speed test engine to develop a combustion concept for the new engine. This will be done in close collaboration with MAN and will also form the basis for defining any requirements for exhaust-gas aftertreatment.

Woodward L'Orange is a leading manufacturer of injection systems and will produce the injection system for the ammonia tests at TUM and WTZ. Together with MAN, the technology will be scaled up to large, four-stroke engines in the project.

MAN Energy Solutions will transfer the technology to large-bore, four-stroke engines and and prepare for commercial development and production.

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MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.