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# MAN Energy Solutions Upgrading Four-Stroke Engines for Green Future-Fuels

## Methanol to be available for maritime use from 2024

In continuously developing the range of services for its portfolio of four-stroke engines, MAN Energy Solutions enables its customers to exploit a multitude of synthetically manufactured, climate-neutral fuels in the operation of ships or power plants. Already today, MAN engines using power-to-X fuels such as synthetic natural gas (SNG) can be operated totally climate-neutrally.

MAN customers will in due course be able to use other, so-called 'future fuels' – such as ammonia, methanol and hydrogen – also produced in a climate-neutral manner. While these fuels are not currently available on the market, their use in MAN units will, however, be possible through the incipient start-up of green-fuel production facilities. These, in turn, will further reduce harmful emissions and reliably meet future, stricter environmental requirements and regulations.

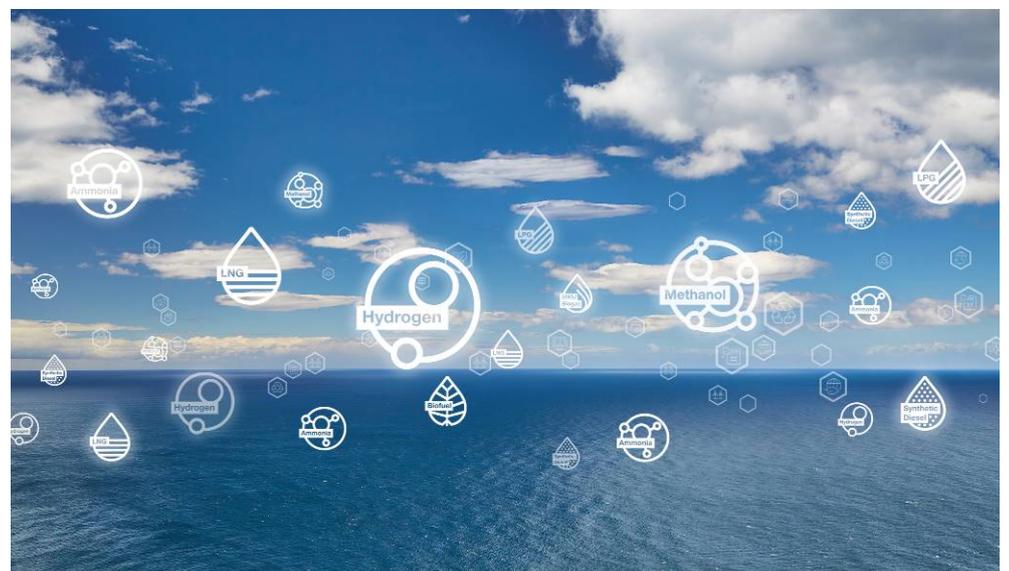
"Green future-fuels are key to the decarbonization of shipping," said Marita Krems, Head of the Four-Stroke Marine Engines Division at MAN Energy Solutions, outlining the importance of the issue. "By 2050, greenhouse gas emissions in ship transport must decrease by at least 50%. We will therefore make future-proof solutions available to our customers, which will make the diversified use of green fuels possible – both for new engines and engines in the existing fleet."

Even today, MAN customers can fall back on the use of biofuels as ship fuel in order to reduce emissions. "Sustainably produced biofuels, for example those derived from waste woods, can reduce CO<sub>2</sub> output by up to 85%," said Krems. "In 2022, we will offer engines that are designed for later conversion – if required – to methanol operation. From 2024, we will make solutions for the use of methanol in four-stroke engines available."

The company also has its sights firmly set on the use of ammonia. Krems said: "In container ships with a two-stroke engine, ammonia will certainly play a decisive role and such an engine will be available from 2024. When it comes to the four-stroke segment, we have already discussed the relevance of this fuel in great detail with our customers. Cruise ships or ferries, for example, are basically floating cities and have especially high safety standards. Here, we only see options for ammonia's use if initial, positive operating experiences have been gathered in other segments."

"As soon as there is a demand for an ammonia solution, we will be ready," emphasized Krems. "With our two-stroke engines, we are the pioneers when it comes to ammonia and we have the necessary, developmental competence. Together with partners – as part of the 'AmmoniaMot' research project – we have already defined the steps necessary for the development of a four-stroke, multi-fuel engine that can also operate on ammonia. As soon as relevant fields of application emerge, we will be able to handle them."

In all this, MAN Energy Solutions continues to follow the concept it has built up over several generations. "In addition to new engines, we are also always thinking in terms of retrofitting the existing fleet," said Bernd Siebert, Head of Four-Stroke Retrofitting at MAN PrimeServ, MAN Energy Solutions after-sales brand. "Ships have a lifetime of several decades. After retrofitting, engines already in the field have the same capabilities as our new engines. This is how we safeguard, not only the climate, but also our customers' investment."



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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