

SMM 2026: Bosch presents injection technology for the large engines of the future

Renewable synthetic fuels such as methanol and ammonia reduce carbon emissions from ships

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- ▶ International shipping accounts for 2 to 3 percent of carbon emissions worldwide.
- ▶ Bosch is developing injection solutions for operating large engines with alternative fuels.
- ▶ The new Bosch injector can work with hydrogen, methanol, ethanol, or ammonia.

Stuttgart and Hamburg, Germany – Ships account for about 80 percent of international freight traffic, and also cause 2 to 3 percent of all man-made carbon emissions worldwide. Bosch, a leading supplier of injection systems for maritime engines, is working with partners to develop solutions that will enable ships to use renewable synthetic fuels efficiently and reliably in the future. In this way, Bosch is making an important contribution to achieving the International Maritime Organization's (IMO) ambitious climate goals on the path to net-zero greenhouse gas emissions by 2050. At the SMM international trade show in Hamburg, the technology company is showcasing a new injector for alternative fuels that can be used with both liquid and gaseous fuels. "The maritime market will continue to grow in the coming years, while needing to decrease its environmental impact dramatically," says Dr. Stefan Schenk, who oversees the Large Engines business unit in Bosch's Power Solutions division. "To truly establish sustainable fuels in the shipping industry, we need policymakers, the fuel industry, shipbuilders, and shipowners around the world to work together."

According to forecasts by the UN Conference on Trade and Development (UNCTAD), global maritime traffic is expected to grow by an average of about 2 percent per year through 2030. Other long-term scenarios from the International Transport Forum also assume that the volume of freight transport worldwide could nearly double between 2019 and 2050. Shipping remains by far the most important mode of transportation for global trade. "The market for

climate-friendly maritime propulsion systems will grow rapidly in the coming years,” Schenk says.

Greater sustainability in maritime applications – and beyond

Current Bosch injection systems have so far been used primarily with diesel or diesel-based fuels and are mainly installed in medium- and high-speed large engines. These can be found, for example, on ferries, tugboats, yachts, or in generators that provide onboard power for large container ships and freighters. Bosch components are already compatible with drop-in fuels such as biodiesel and paraffinic diesel. This means that, provided they are fueled appropriately, such components can already help reduce carbon emissions.

“Our development efforts are now focused on injection and air-injection components for liquid and gaseous alternative fuels,” Schenk says. The new Bosch injector can work with a variety of fuel types, including hydrogen, methanol, ethanol, and ammonia, and its design can be customized to suit the specific application. It can be used for either intake manifold injection or for low-pressure direct injection and is currently being tested by Asian customers. Some of the development challenges associated with methanol use include, for example, modifying combustion processes, ensuring reliable cold starts, and addressing material compatibility and wear caused by the fuel’s lower lubricity. This is because, without appropriate modifications, existing products are not suitable for use with methanol or ammonia. Bosch offers special injection valves for the gaseous injection of natural gas, hydrogen, or ammonia into the intake manifold. In addition to maritime applications, Bosch technology is also used in large stationary engines, construction machinery, locomotives, and more.

Millions invested in the Hallein location

To advance these developments further, Bosch recently put a methanol infrastructure into operation at its engineering location in Hallein, Austria, investing tens of millions in the project. Within the Bosch Group, this facility serves as the global center of competence for large-engine injection systems. “Decarbonizing large engines requires a diverse array of technologies – especially where electrification reaches its limits and where renewable synthetic fuels will play a key role in the future,” Schenk says. “With the new methanol infrastructure, we’re laying the groundwork to further develop these technologies and get them ready for volume production and deployment by our customers.”

Press photos and infocharts are available on the Bosch Media Service at www.bosch-press.com.

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