

## Shipbuilding is ready for a change of course



The bunker vessel Kairos supplies the hold dredger Scheldt River in the Elbe port of Brunsbüttel with LNG by means of ship-to-ship transfer. A further indication that LNG demand is rising continuously. Source: Brunsbüttel Ports

**Maritime shipping should be climate-neutral by around 2050 – the Verband Deutscher Reeder (VDR, German Shipowners' Association) sees this decision by the International Maritime Organization (IMO) as a “real milestone”. The supplier industry also sees decarbonization as an opportunity, as the global fleet offers great potential for conversion. And “marine technology is ready for this”, explains the Verband Deutscher Maschinen- und Anlagenbau (VDMA, German Engineering Federation).**

Shipping – and therefore also shipbuilding – is an important industry. “Today, it is transporting around 90 per cent of all goods worldwide,” explains VDR. It is now called upon to manage the maritime energy transition. A mammoth task, as there are around 10,000 seagoing vessels and 15,000 inland waterway vessels in Europe that need to be modernized or rebuilt. More than 100,000 merchant ships and 25,000 naval vessels are in service worldwide.

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## **LNG replaces marine diesel**

The course correction is drastic: While marine diesel and heavy fuel oil have dominated the ship propulsion market to date, LNG will initially steadily replace conventional fuels – also driven by the changed geopolitical situation. “Many European countries that imported Russian pipeline gas before Russia's war against the Ukraine have increasingly switched to liquefied natural gas in 2022,” explains Germany Trade & Invest (GTAI). This has led to more orders for tankers to transport LNG. Take South Korea, for example, the number 2 behind China: According to GTAI, the majority of new orders placed with South Korean shipyards in 2022 has already been ordered with more environmentally friendly propulsion systems.

Initially, the more environmentally friendly LNG will be increasingly used as a marine fuel. According to Herose, the use of liquefied natural gas as a fuel has considerable environmental benefits: “low emissions of carbon dioxide, sulphur dioxide and nitrogen oxides”. For installation on ships, the company offers numerous valves that also meet the important fire safety requirements.

## **New challenges through LNG**

“On board seagoing vessels, valves are an important component of LNG systems,” emphasizes the VDR. Valves are required for intermediate ventilation and for venting the wire harness to the engine. Some of them have to function under extreme environmental conditions, for example at very low temperatures, and must be fireproof.





A look into the engine room of the super yacht “Areti”. Photo: Lürssen Yachts

On cruise ships, thousands of vacationers rely on the reliability of the engines. Valves from müller co-ax, for example, make a decisive contribution to this – both with regard to the safety concept and the periphery of engines. LNG is only heated and converted to a gaseous state shortly before consumption in order to supply the engine with natural gas. “Particularly strict guidelines must be observed when using gas,” emphasizes müller co-ax. The pipe systems must be flushed and checked regularly. For these and other applications on marine engines, directly controlled solenoid valves from müller co-ax are used.



The natural gas becomes liquid at a temperature of around -162 C – “this means that our valve must also function perfectly at these low temperatures,” explains müller co-ax. There are also high safety requirements – if LNG vaporizes, an explosive gas is produced.

### **Shipbuilding essential for the energy transition**

LNG drives have already been proving their worth for several years – Meyer Werft installed them in a cruise ship for the first time in 2018, and the LNG fleet is growing worldwide. Container ships are also increasingly being retrofitted, as the German association “Maritime Plattform” reports. Growth is also expected in shipbuilding for offshore wind energy – installation vessels and cable ships are urgently needed at sea for the energy transition. According to the

VDMA, environmental – and social – issues are increasingly becoming a competitive advantage in the shipbuilding and offshore supply industries.

Take Germany, for example, which wants to master the energy transition. “The expansion targets cannot be achieved without the involvement of the shipbuilding industry,” explains the Verband für Schiffbau und Meerestechnik (VSM, German Shipbuilding and Ocean Industries Association). The offshore boom is a great opportunity for shipbuilding. Currently, most LNG-powered ships are LNG tankers for the transportation of liquefied natural gas. They use their load as fuel, as a small part of the charge is constantly evaporating.



An LNG cruise ship leaves the building dock. Source: Meyer Werft



### **Valve technology crucial for efficiency**

In addition to valves for the drive, valves for LNG terminals are required, which in turn are crucial for refueling LNG ships. This requires solutions for unloading, storage and regasification. Emerson for example develops automated valves for cryogenic use “that provide safe, leak-free shut-off during demanding unloading operations, including isolation, flow control and emergency shut-off”. Safety valves help to reduce overpressure damage to LNG tanks, loss of natural gas and maintenance costs. The choice of valve technology has a major influence on system safety, efficiency,

reliability and therefore cost-effectiveness. Emerson has therefore developed specific solutions for the LNG sector.

Valves can be found on board in many other applications, including those pertaining to fresh water, hot water, cooling water and process water as well as for fire protection. Air conditioning, room heating, kitchens and swimming pools require valves. Soma butterfly valves are used, for example, on product and chemical tankers in ships' pipelines to keep different cargoes separate during transportation. Ball valves are used to check for leaks.

### **Focus on greener fuels**

The shipbuilding industry is already looking at alternative fuels for the time after fossil LNG. It remains to be seen which fuel will predominate – presumably from the next decade onwards. The future could belong to ammonia, hydrogen, green methanol and synthetic diesel. Valves and actuators must be designed and digitized accordingly, as for example different temperatures have to be handled with these fuels.

These alternative fuels are still more of a vision than a tangible reality, as the logistics still have to be set up. Investments in the production and handling of hydrogen in Europe and the supply of ammonia and methanol to the shipping industry are necessary, explains the Zentralverband der deutschen Seehafenbetriebe (Central Association of German Seaport Operators). According to the VDR, a global legal framework is required for the market ramp-up at competitive conditions, “which offers energy and fuel suppliers as well as the shipping industry the necessary planning and investment security”. Legislation is needed at EU level, for example. Over the next few years, the shipbuilding industry will therefore undergo a massive transformation, supported by the valve industry. But it should be able to get that sorted out...



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