

Dieter Hilmes, TGE Marine Gas Engineering GmbH, Germany, discusses the importance of the German funding program for the use of LNG as marine fuel.

MONEY MAKES THE WORLD GO ROUND

“We all have only one earth”, said German Chancellor Angela Merkel during the UN Climate Action Summit last September in New York. Germany has set itself the goal of cutting CO₂ emissions by more than half of the 1990 levels by 2030, and to be climate-neutral by





Figure 1. Picture of *Containerships Nord*.



Figure 2. Picture of *Wes Amelie* (copyright: Wessels Reederei).

achieve this goal, such as expanding the use of renewable energy, phasing out of coal-fired power stations by 2038 at the latest, and the decision to extend CO₂ pricing to the construction and transport sectors.

As the transportation sector has the potential to become 'greener', it is also important to use more environmentally friendly fuels in the maritime industry. In order to facilitate and support these developments, the German Federal Ministry of Transport and Digital Infrastructure (BMVI) is funding newbuild and retrofit projects for seagoing vessels to use LNG as a marine fuel. The goal of the funding program is to promote the use of LNG in German maritime transport.

As a marine fuel, LNG contributes to the reduction of greenhouse gas (GHG) and air pollutant emissions. Compared to conventional, oil-based marine fuels, LNG produces zero sulfur oxide (SO_x) emissions. Nitrogen oxide (NO_x) emissions are reduced by up to 90% (depending on the basis of comparison), and particle emissions by approximately 98%. The guideline on grants for installation and retrofitting seagoing vessels for the use of LNG as a marine fuel from August 2017 advances the adoption of LNG in German maritime transport. The aim of the

guideline is to increase demand for LNG as a marine fuel in Germany, and thus also to provide incentives to develop the required LNG supply infrastructure in ports.

In 2015, German ship owners called for government subsidies for LNG newbuild vessels. A statement issued by the ship owners association (VDR) says an incentive plan for new vessels built to exclusively or partially use LNG bunkers would boost Germany's already strong position in LNG technology. It would also open the market for LNG-powered vessels, whose construction costs are up to 25% higher than those of standard ships with conventional diesel engines.

The first mover

In 2013, the German ship owner Wessels Reederei decided to retrofit an existing container feeder vessel from heavy fuel oil (HFO) to LNG operation. The 1000 TEU container vessel *Wes Amelie* was selected for this conversion, with its 22 sister vessels as further conversion candidates in the wake of this first pilot. TGE's involvement in this challenging project started at an early stage. The main difference to a newbuild is typically the missing space for the LNG tank and the fuel gas system equipment. Accordingly, TGE Marine's naval architects were involved in the integration of the LNG tank and the fuel gas system into this existing vessel. For example, the placement of the 500 m³ Type C tank could be achieved in the forecastle and below the first row of containers with a minimum loss of cargo space. Further challenges that could be solved during the design phase included simultaneous operation of LNG bunkering and container loading, as well as mitigation of risk due to falling objects.

The *Wes Amelie* was the first ship of its kind in the world to be transformed into an LNG-powered vessel. The conversion works started in June 2017, and were formally concluded at the beginning of September. The Federal Ministry of Transport and Digital Infrastructure released a grant of 60% of the conversion cost for the vessel's retrofit in October 2015 through the 'Mobility and Fuel Strategy Program'. This was the pilot funding program for the later established official funding program for the use of LNG as a marine fuel.

First funding call

In 2017, the German Government established a funding program which was tailored to promote LNG as maritime fuel. The official program was named 'Funding program for the use of LNG as a marine fuel'. The first funding call was launched in 13 December of that year.

The funding was intended to provide targeted incentives for the diversification of the fuel base and the use of natural gas as marine fuel, particularly in the area of German ports and European waters, in order to realise considerable advantages for climate, environmental and health protection. In order to receive the funding, new engines to be installed had to comply with IMO Tier 3 (corresponding to MARPOL Annex VI regulation 13 no. 5.1.1). Similarly, engines to be converted also had to meet this emissions standard after the conversion.

The following conditions had to be met in order to receive funding:

- The equipping of new ships with main engines for the use of LNG as ship fuel in pure gas or dual-fuel operation.
- The conversion or replacement of conventional diesel engines on board existing ships for the use of LNG as marine fuel in pure gas or dual-fuel main engines.
- In addition to the funding program for the main engines, it was also possible to receive subsidies for the auxiliary engines on board. Under the condition that the newbuilding or conversion project was subsidised according to above points, subsidies for the auxiliary engines were also possible.

The applicant had to be a company or authority that owned a ship, which was registered in the German ship register and had an EU-flag, and which was using its vessels partially in European waters. The funding took the form of an investment grant, which was calculated on the basis of the respective additional investment costs required to use LNG as marine fuel. The amount of funding was dependent on the size of the shipping company, in accordance with the small and medium enterprises' (SME) definition for company sizing of the EU:

- 40% of the eligible costs for bigger companies.
- 50% of the eligible costs for mid-size companies.
- 60% of the eligible costs for smaller companies.

The beneficiary had to ensure the commercial use of the funded ship over a period of at least eight years after equipping or upgrading. Premature sale, dismantling or renewed refitting and an insolvency can lead to the withdrawal or revocation of the grant notice and the obligation to repay the grant. The program is limited until 31 December 2020.

Promoted projects

Two newbuild projects received grants out of the first funding call. The ship owner Nordic Hamburg was subsidised for two 1400 TEU container feeder newbuilds. In December 2018, the first vessel, *Containerships Nord*, of a series of six identical ships went into service. In close cooperation with the ship designer and owner, TGE Marine developed the space saving vertical tank design and designed and delivered the fuel gas system for the two-stroke low pressure engines. With this solution, only minor modifications to an existing ship design were necessary.

Furthermore, the German ferry operator TT-Line, which operates ferries in the Baltic Sea, received funding for two new RoPax ferries out of the first funding program. In addition to this, the conversion of an existing vessel was also funded by the first funding call. The ferry operator AG EMS received financial means for retrofitting the *Münsterland* ferry from liquid fuel to LNG. This ferry operates between ports of Emden/Eemshaven and Borkum.

Second funding call

Due to high demand from the first call and the unbroken interest in further LNG-operated ships, the Federal Government decided to initiate a second call for funding. The application phase for the second call for proposals, which supplements the guideline on grants for

equipping and retrofitting seagoing vessels to use LNG as a marine fuel, started on 18 September 2019. Applications had to be submitted by 18 December 2019 to the Federal Agency for Administrative Services (BAV).

In addition to the first funding call, the following conditions have been added:

- A detailed breakdown of eligible/fundable expenditures.
- The maximum limitation of €7 million funding per newbuild or conversion project.
- The definition of a minimum operation time of 20% in European waters within the given earmarking period of eight years.
- More detailed requirements regarding the applications.
- More comprehensive requirements for project description and appendices.
- Definition of obligatory disclosures.
- Definition of prioritisation criteria:
 - ◆ 30% – Contribution of the project to increasing the demand for LNG as marine fuel in German ports and in European waters. Realisation of local advantages for climate, environment and health protection.
 - ◆ 20% – Expected minimum share of the operating times in European waters over the period of eight years.
 - ◆ 20% – Proportion of value added and job security/creation within the EU.
 - ◆ 15% – Efficient use of funds to achieve the goals of the funding guidelines.
 - ◆ 10% – Qualification and expertise of the applicant and project partners.
 - ◆ 5% – Innovation content of the technical concept.

It is expected that an announcement will be made in spring 2020 revealing which projects will receive funding. The project must begin within six months after receipt of the notice of grant. The project duration includes the equipping or retrofitting phase, and is determined with the participation of the applicant. In principle, it should not exceed a period of two years from the date of the grant payout. According to the market, some 45 applications for subsidies were received by the closing date. Furthermore, there are rumours that many applications for conversions of container feeder ships, as well as for newbuilds, have been received.

Conclusion

Without the funding program, small and medium-sized shipping companies would hardly be able to build new LNG-powered vessels or convert to LNG-fuelled ships. Furthermore, LNG infrastructure in the European ports would develop more slowly due to the lower demand of LNG. From these points of view, the German funding program is an important component in realising LNG infrastructure in German ports and European waters, and is thus helping to deliver significant benefits for climate, environmental and health protection. [LNG](#)