

21 August 2024

Innovative river-seagoing gas tanker “Vanguard”: HGK Shipping develops design to meet new transport requirements in the energy revolution

Duisburg. HGK Shipping has designed a new kind of river-going coastal vessel in order to meet the requirements of industry in an increasingly hydrogen-based economy. Using the “Vanguard” project name, the continent’s largest inland waterway shipping company has designed the first river-seagoing gas tanker in Europe to transport cold liquefied ammonia (NH₃) and liquefied CO₂ (LCO₂).

The “Vanguard” is 125 metres long and 17.50 metres wide. Among other things, it is able to transport cold liquefied ammonia and liquefied carbon dioxide in its tanks. The extremely modern ship designed by HGK Shipping will not, however, just travel along rivers, but the “Vanguard” can also operate in European coastal waters and beyond. As there is no need to tranship the cargo between different modes of transport, this transport solution creates huge value added. This both applies to planned transport operations to supply hydrogen from Spain and Portugal, for example, but also to transport the CO₂ that is expelled at the designated offshore fields, which are often located in the North Sea.

In order to make the transport operations as sustainable and resource-efficient as possible, a Wind Assisted Propulsion System (WAPS), a kind of sail, supports the diesel-electric “future-fuel-ready” drive system. The enormous experience gained from other HGK Shipping designs for optimising operations in shallow waters has also been integrated in the “Vanguard” concept.

Shipping CEO Bauer comments, “Increasing decarbonisation is changing flows of goods”

Steffen Bauer, the CEO of HGK Shipping, contextualises the innovative ship design in his plans for the company’s development. “The increasing process of decarbonisation of production processes is changing flows of goods. This is then opening up opportunities for our sector and for HGK Shipping to offer the economy new transport solutions that are available at short notice. The ‘Vanguard’ offers industry additional capacity to safely and sustainably transport liquefied ammonia and carbon dioxide from Scandinavia as far as the Iberian Peninsula and use the seaports as gateways to the network of European inland waterways.”

“The river Rhine in particular, the upper regions of which will be navigable for the ‘Vanguard’, offers an efficient alternative for pipeline structures, which either don’t exist or cannot be built in the short term, for industries that have a strong presence on this river,” the HGK Shipping CEO says. HGK Shipping is therefore repeatedly setting new standards in ship design for inland waterway shipping from a logistical point of view in order to help support the “European Green Deal” with its planned switch of production processes, which includes using “green” ammonia.

“The newly designed river-seagoing gas tanker and the concept for other successors to ‘Vanguard’, which will be planned in line with customers’ requirements, fully exploit the technical possibilities for a smooth crossover from coastal waters and the inland waterway system further inland in the best possible way,” says Wolfgang Nowak, the Managing Director of the HGK Shipping subsidiary, Amadeus, which is responsible for this business. “First of all, preventing any stop at the seaports reduces the risks associated with transshipment and, secondly, it offers our customers savings potential in terms of time and costs.” Amadeus has been using the benefits of coastal vessels in the HGK Shipping cosmos for this purpose for a quarter of a century.

Support for industry when removing residual carbon dioxide

The “Pioneer“ project, which was announced in April 2024, and now the “Vanguard” project complement each other according to the plans to use them on the different waterways and each enable large transport volumes. The underlying ship concepts support industry when removing residual carbon dioxide, which is emitted and collected in liquid form as LCO₂ from the different production processes. With the help of the “Carbon Capture and Storage“ (CCS) and the “Carbon Capture and Utilization” (CCU) procedures, it is possible to prevent CO₂ emissions or make further use of them in chemical processes. The second important field of use for these newly developed gas tankers is to deliver the hydrogen derivate ammonia for further processing, so-called cracking of NH₃, in order to supply the markets with sustainable, green energy.

Notes on the attached photo:

The animation shows the river-seagoing gas tanker “Vanguard” developed by HGK Shipping.
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About the HGK Group:

Häfen und Güterverkehr Köln AG (HGK) is the logistics company within the City of Cologne’s public utilities group. Formerly just a port operator, HGK has developed into a group that provides integrated transport and logistics services with operations across Europe. Structured in five divisions, Logistics & Intermodal, Shipping, Rail Operations, Infrastructure & Maintenance and Real Estate, the HGK Group operates the largest inland waterway port network in Germany, one of the largest private railway companies for transporting cargo, specialist logistics firms and terminals as well as its own railway network

and workshops for railway goods traffic through its subsidiaries and holding companies. HGK Shipping GmbH is the largest inland waterway shipping company in Europe.

About the HGK Shipping division:

HGK Shipping is part of Häfen und Güterverkehr Köln AG. Its fleet comprises about 350 vessels, including owner-operated ships. The spectrum of goods transported ranges from liquid chemical products and liquefied gases to dry goods and even break-bulk cargo.

About the Short-Sea Business Unit:

Amadeus Schifffahrts- und Speditionen GmbH, a subsidiary of HGK Shipping GmbH, employs a fleet of 13 river-seagoing coastal vessels for dry and liquid goods and particularly focuses on river-sea shipping.