

The role of the maritime industry in establishing a German hydrogen economy.

November 2021: German Maritime Centre publishes results of the ISL hydrogen study for the maritime sector.

Alternatives to fossil fuels have long been essential not only from an ecological point of view, but also form a promising, flourishing economic market for the future. Hydrogen is considered to be one of the most important energy carriers of the future. Due to its wide range of applications, hydrogen is becoming increasingly important within the maritime industry. However, for the establishment of a hydrogen economy, specifications are necessary with regard to framework conditions, goals and measures.

In spring 2021, the German Maritime Centre has assigned the Institute of Shipping Economics and Logistics (ISL) together with its partners Sphera Solutions GmbH as well as GMW Consultancy to conduct a study on this complex of topics.

The study prepared by ISL and its partners examines the national hydrogen strategy of the German government and the strategies of northern German states as well as the European Union. Furthermore, the framework conditions and development statuses of hydrogen and power-to-X (PtX) technologies are assessed from the perspective of the maritime industry in Germany. The study provides a broad overview of the current state of relevant hydrogen technologies. The main focus is set on two aspects "Maritime industry as consumer" and "Maritime industry as a logistics player".

The climate target, set by the European Union to reduce greenhouse gas emissions by at least 55% by 2030, requires extensive and rapid implementation of all feasible measures with regard to the maritime industry - increasing energy efficiency, using alternative fuels and providing the necessary infrastructure. Expanding the use of renewable energies for shipping and utilization of climate-neutral fuels are also important elements of a climate protection strategy.

The aim of the study is to define the tasks for the maritime industry and the public sector to establish an emission-free German hydrogen economy from production via storage and transport to the consumer. In this context, the use of hydrogen technologies for ships and watercraft as well as hydrogen applications at seaports are considered in a multi-layered way.

For this purpose, ISL first investigated relevant framework conditions, key figures and requirements. Furthermore, necessary adaptations and amendments of laws and regulations for the production, use and transport of green hydrogen and hydrogen-based fuels were elaborated. The findings clearly show the need for further research regarding various hydrogen products as alternative fuels within maritime or inland navigation and ports as well as transport and commodity handling. The current and future role of shipbuilding, shipping and ports is in this context considered as well.

The study clearly shows that multilayered and labor-intensive measures are required in order to facilitate reliable hydrogen applications in the future. It is clear that Germany will not be able to meet its demand for green hydrogen from domestic sources. Australia, Chile, Iceland, Canada, Morocco, Norway and the United Arab Emirates are considered as examples of possible production locations for hydrogen products, which Germany could import by tank vessels or via pipelines.

Calculations have shown that transport by ship is competitive in comparison with transports via pipeline. In fact, shipping becomes more competitive as the transport distance increases, thus it must be considered as a fundamental component for hydrogen and PtX- imports. In addition, German

seaports play a central role in handling hydrogen and its derivatives for imports and for onward transport to the hinterland.

The study provides research requirements in order to facilitate the successful implementation of hydrogen and PtX transport, handling, storage and application in practice. However, politics and administration must in advance develop corresponding regulations. Based on the above-mentioned results, the study formulates explicit recommendations for action in three categories - for politics, science and technology.

About the ISL:

The ISL - Institute of Shipping Economics and Logistics was founded in Bremen in 1954. With the combination of tradition and modern science, it has since then established itself as one of the leading institutes for maritime research, consulting and know-how transfer in Europe with a focus on Maritime Markets, Maritime Environment, Maritime Security, Maritime Transport Chains, Simulation, Digital Innovations und Software Solutions.

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