

## **Innovation in the Danish Maritime Industry - value creation between academia, industry and public sector**

*Brief from the Danish Academy of Technical Sciences (ATV)*

### **Introduction**

On October 9 2015, ATV held a seminar at the Technical University of Denmark (DTU) on Innovation in the Danish Maritime Industry. During recent years, many maritime research and education activities have been initiated. Since 2010, ATV has taken part in initiating some of these activities with funding from The Danish Maritime Fund. The next step for ATV was to take stock of the development until today and look into and discuss new innovative needs, opportunities and possible actions in the Danish Maritime Industry. This was the agenda of the seminar "Innovation in the Danish Maritime Industry - value creation between academia, industry and public sector".

The seminar was organized by ATV, DTU, Southern University of Denmark (SDU), Aarhus University (AU), Aalborg University (AAU), FORCE Technology, Danish Maritime Authority and MAN Diesel & Turbo. About 80 persons from the industry, knowledge institutions (i.e. the universities and GTS institutes) and public sector participated in the seminar. The seminar was made possible thanks to funding from the Danish Maritime Fund.

### **Observations from the seminar**

ATV is in the following presenting some key findings from the seminar. The findings concern conditions that are necessary for obtaining more innovation in the maritime industry.

- **Collaboration between the industry and knowledge institutions**

Good collaboration has been established between the industry and knowledge institutions over the past five years. Collaboration between industry and knowledge institutions is important in order to start up the necessary research activities that are needed in the industry. Collaboration is also important as a platform to create more innovation. During the last five years, collaboration between industry and knowledge institutions has been strengthened. This is a good platform to build on to start more research and innovation activities. Both collaboration and a good knowledge platform are important factors for the industry.

- **Lean and innovation**

Industry today is facing management demands to keep costs at a minimum due to hard competition. This is a barrier for investing strategically in innovation. Innovation activities facilitated by for example a cluster must consider the circumstances in the Danish Maritime Industry.

Lean is a term for industry today that actually implicates innovation. The clusters that facilitate collaboration between industry, public sector and researchers must include this in their strategy.

- **Educational need**

The need for education involves both classical maritime competencies and new disciplines. The disciplines named as classical are ship design and naval architecture, fluid dynamics and acoustics, oceanography, marine engineering and electrical systems, advanced materials and structural integrity and humanities and social sciences. Automation, digitalization and sustainability are amongst the new disciplines that challenge the old ones. The seminar also contained a discussion on broad candidates versus more specific ones. There is a need for specialized engineers, but also a need for more general engineers with especially the abilities to lead, develop and innovate.

Furthermore, it is important to increase the visibility of the different candidates the universities produce. This with the purpose of making it clearer towards the industry what choices they have when recruiting. To secure the educational need on the longer term, a strengthened, ongoing collaboration between educational institutions and industry about educational curriculum and teaching is needed.

- **Technology**

At the seminar, eight technological areas were named which can help transforming the maritime industry in the nearest future. The areas are shipbuilding, propulsion and powering, smart ship, advanced materials, big data analytics, robotics, sensors and communications (data transfer). For example, shipbuilding is moving towards a higher level of automation and integration of software.

Innovation can happen in many, interdisciplinary areas, but it is unclear where the need and the potential are when it comes to the innovative, technological development until 2030. Collaboration on mapping of this could be promising.

- **Cluster Inspiration**

CLEAN is a large Danish cluster with focus on energy and environment and with a lot of experience in facilitating collaboration between companies and knowledge institutions. CLEAN can provide inspiration to the Danish maritime cluster in general. It is important to create good conditions for companies enabling them to make innovation and production. That is, for example, facilitation of a close collaboration with the knowledge institutions, providing access to new training and educational facilities, procuring access to research findings and establishing partnerships between business, the public and authorities.

In addition, clusters are an advantage in situations where they concretely facilitate innovation and developing projects.

- **Knowledge circulation industry - academia**

An important condition for creating innovation is to transfer new knowledge between industry and academia. At the seminar some examples of this happening was mentioned, but only to a smaller degree. Many companies in the maritime industry find it challenging to *start* participating in a research activity and to *be* a part of a research activity in general. However, it is important that the industry is participating which reveals an important need to facilitate coordination of the activities and to facilitate collaboration between research institutions and industry.

Some large companies mentioned that they do not participate in big innovation projects or make use of for example Industrial Ph.D.'s. They only have collaboration with students at bachelor level.

Good tools are a combination of strategic partnerships and innovation platforms. Furthermore, Industrial Ph.D.'s were highlighted as an important and a good tool of which the industry can make better use.

To create innovation it is important that the value chain contains applied research and development, testing of technology outside the lab, analysis, measuring and training.

The lack of a drive for industry to engage in innovational activities was mentioned as a barrier. Industry can sometimes with great benefit think of the output in a longer perspective.

### **More information**

If you have questions, please contact consultant Maja Lænkholm at +45 45 96 08 25 or [ml@atv.dk](mailto:ml@atv.dk). You can find the presentations from the seminar [here](#).