



AEGIS: The new sustainable and highly competitive waterborne logistics system for Europe.

The Advanced, Efficient and Green Intermodal Systems (AEGIS) project will leverage a multidisciplinary team to integrate new innovations from the area of Connected and Automated Transport (CAT) to design the next generation sustainable and highly competitive waterborne transport system in Europe. This includes more diverse sizes of ships and more flexible ship systems, automated cargo handling, ports and short sea shuttles, standardized cargo units and new solutions for digital connectivity.

The main objective of AEGIS is to develop a new waterborne logistics system for Europe that leverages the benefits of ships and barges while overcoming the conventional problems like dependence on terminals, high transshipment costs, low speed and frequency and low automation in information processing. AEGIS intends to use new innovations from the area of CAT, including smaller and more flexible vessel types, automated cargo handling, autonomous ships, new cargo units and new solutions for digital connectivity to regain the position that waterborne traditionally had in freight transport. Ships are most efficient when the cargo holds are full. AEGIS will look for ways to attract new cargo, inbound as outbound, to waterborne transport. This requires new types of services, new business models and better logistics systems.

The project is now in month 25 and goes until May 2023.





Recent events.

AEGIS' very first physical consortium meeting.

The AEGIS partners were gathered in Copenhagen and then the DFDS ferry Crown Seaways, sailing from Copenhagen to Oslo on May 23rd, this year. It was a pleasure to finally meet, and it was two very fruitful days!



The main outcome from the gathering is that the project is well on track and the cooperation between partners and work packages is very good. The AEGIS use cases are getting up to speed and the project is getting higher attention within the involved partners, as they see business potential with the AEGIS concepts.

"It was a great pleasure to finally meet all the fantastic people in the AEGIS consortium. After two years of online meetings, we can really feel the joy of physical attendance. We realised that we did a lot of great work over the last two years. I also saw that we clearly would have benefited from meeting physically earlier, but now we have a great foundation for the last year of the project. We are really looking forward to continuing the collaboration and I am confident that AEGIS will deliver great value in the end!"
says AEGIS coordinator, Odd Erik Mørkrid, Senior Project Manager at SINTEF Ocean, Norway.





AEGIS supported the autonomy summit.

AEGIS joined forces with AUTOSHIP and MOSES and supported the 3rd International Ship Autonomy & Sustainability Summit at Nor-Shipping 2022.

THE 3rd INTERNATIONAL
SHIP AUTONOMY AND
SUSTAINABILITY SUMMIT



Nor-Shipping 2022

EU Waterborne Autonomy Research



AUTOSHIP
Autonomous Shipping Initiative for European Waters

MOSES



<https://aegis.autonomous-ship.org/> <https://www.autoship-project.eu/> <https://moses-h2020.eu/>

NFAS



European
Commission



The 3rd International Ship Autonomy & Sustainability Summit was arranged on the 5th of April this year, at Nor-Shipping, and moderated by AEGIS' very own Ørnulf Jan Rødseth. The conference was a cooperation between SINTEF, NFAS, EU Commission and Nor-Shipping 2022, and the objective was to help business leaders understand and prepare for the future by exploring the impact of global trends and how autonomous ships can create future growth.

Link to recording of the full summit:

<https://nor-shipping.com/ship-autonomy-and-sustainability/>



The project has received funding from the European Union's Horizon 2020 Research and innovation program under Grant Agreement N°859992.



Partner presentations.

DTU – Technical University of Denmark

Founded in 1829 with the mission of creating value for the benefit of society, the Technical University of Denmark (DTU) is an international elite technical university where education, scientific advice, and innovation rest on a solid foundation of world-class research. DTU is at the academic and multidisciplinary forefront of the technical and the natural sciences with new initiatives in a number of demanding engineering disciplines, including sustainable energy technology and life science. 11.200 students are educating themselves for the future, and 6,000 employees focus each day on education, research, consulting and innovation, which contribute in creating value, welfare, and growth.

In the AEGIS project, DTU is represented by the Department of Technology, Management and Economics, Division of Management Science (MS). MS develops quantitative tools for decision support at the strategic, tactical and operational levels. Much of the recent research of the AEGIS DTU team deals with maritime logistics, port logistics, intermodal logistics and green logistics, with a recent focus on the drive to reduce greenhouse gas emissions from ships. We have a rich network of academic and industry collaborators, and are very much involved in the recent regulatory developments at the IMO and the EU. A number of projects dealing with the interface between logistics and sustainable transport have been conducted, and AEGIS is the only one that combines the above with an investigation of autonomous waterborne systems.

For further information, contact Harilaos N. Psaraftis at hnpсар@dtu.dk.



Harilaos N. Psaraftis, Professor,
AEGIS DTU team leader



- "The AEGIS project gives us a perfect opportunity to use our expertise to develop methods that can evaluate the economic, environmental and social performance of the AEGIS system, and develop win-win solutions that promote EU transport and environmental policies. We are delighted to work with a team of excellent industry and academic partners towards that goal".



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Port of Aalborg

Port of Aalborg is a multimodal, medium sized port situated in the northern part of Denmark. We connect the North Atlantic and Scandinavia with mainland Europe by sea, rail, and road. Our port is the biggest inland port in Denmark and currently handles 3 million tons of cargo and 67.500 TEU/year.

Green transition and the SDGs are key strategic drivers for us. We want to promote to a sustainable development of our port and logistics facilities by engaging in partnerships with other stakeholders. The AEGIS project provides an exemplary range of new partners with a shared agenda: To move more cargo from road to sea or rail.

For further information, contact Jesper Raakjær at jr@portofaalborg.com.



Jesper Raakjær
Group Chief Visionary
Officer, Professor

"AEGIS connects us with some of the leading experts in Europe, when it comes to port digitalization, automation, logistics and terminal design. Together with the partners we are developing a concept for a new intermodal, automatic green terminal at our port. It has taken our knowledge and ambitions to a whole new level."



PORT OF AALBORG
gate to great



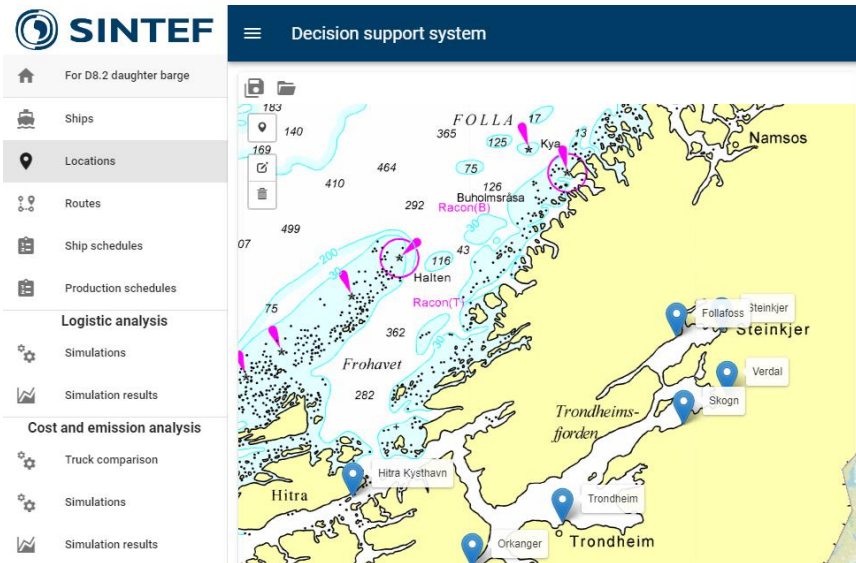
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AEGIS presenting from WP2: Logistics Analysis tool – For redesign of logistics systems.

One of the main objectives of AEGIS is to develop user-centered logistics systems with better service quality and lower impact on environment and society using autonomous ships and terminals. To meet this objective, we have created a Logistics Analysis Tool (LA Tool) that enables us to evaluate the AEGIS use cases.

The LA tool is part of a Decision Support System software toolkit, which also contains a maritime autonomous surface ship (MASS) analysis Tool (MA Tool). The decision support is in the form of key performance indicators (KPIs) for cost, environment, logistical performance, and societal costs. The LA Tool is intended for supporting the early phase design of the logistics network by



modelling locations where cargo is produced, transferred via terminals, and consumed. Based on a projected transportation need, modelled as cargo producing locations, the user can design the logistic system by adjusting the number of ships, ship sizes, routes, and ship schedules, sailing speeds, locations, and cargo handling equipment on ships and locations. Logistical KPIs such as cargo lead time, shipment frequency, storage inventory, ship capacity utilisation, ship schedule keeping, etc. give the user feedback on whether the logistic system gives a satisfying cargo flow and whether it has a reasonable capacity utilisation.

The LA tool also allows the user to perform a bottleneck analysis of both the waterborne transport and on terminal operations for iterative optimization of the cargo flow from producers to consumers via terminals, based on accumulated cargo flows, terminal inventory and required moves to storage on terminals.

The MA Tool is intended for the early phase design of the autonomous ship system concept. It analyses emissions, costs, and societal costs, based on the logistics network design from the logistics analysis tool. This tool can determine expected energy requirements over several years' operation for given routes. This has been complemented with configuration tools, additional cost estimators for infrastructure and logistics operations and shore control as well as the vessel model.





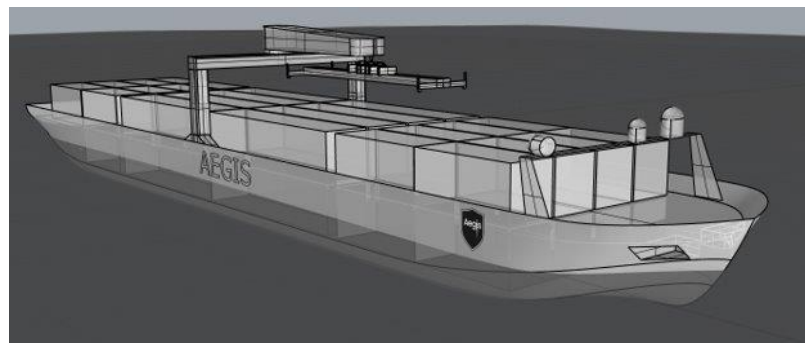
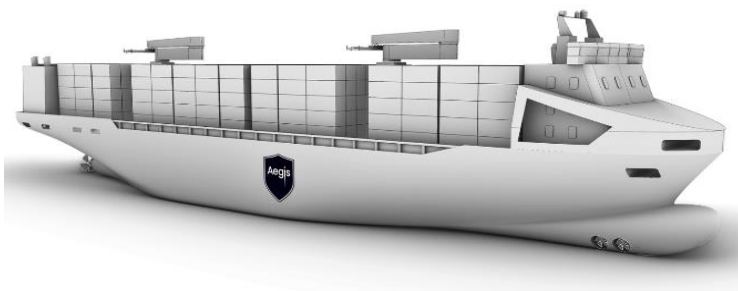
Use case A – Short sea and rural terminals in Norway.

Use case A, led by North Sea Container Line AS (NCL), is picking up and delivering the transport system specification this month. Essentially, this use case is all about combining larger short-sea container vessels (mother vessels) with small and flexible shuttle vessels (daughter vessels) serving fjords and smaller rural terminals in Norway. The basis of the use case is Trondheimsfjorden at Hitra Kysthavn as a transshipment terminal. This is a relatively new port, located in the main fairway of the Norwegian coast, right at Trondheimsfjorden.

The overview below shows the relevant locations, and that the fjord is full of smaller ports, including medium ports such as Orkanger and Trondheim.



Relevant vessel designs for the use case, mother and daughter vessels respectively:





Consortium.



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If you want to learn more about AEGIS, please visit our webpage or LinkedIn page:

aegis.autonomous-ship.org

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