PROJECT NEWSLETTER NO. 5

June 2023

Interreg North Sea Region AVATAR
European Regional Development Fund
Sustainable urban freight transport with autonomous zero-emission vessels
EUROPEAN UNION

Welcome to the AVATAR Newsletter No. 5 | New Milestone! | Demonstrations | Publications

On our own account: AVATAR Newsletter No. 5 launched

Picture: AVATAR project

15.06.2023 –The AVATAR project consortium is publishing project newsletters at regular intervals, about three to four times a year, in which the main events, results, progresses made and general topics relating to the project are addressed. In this newsletter, an overview is given of several dissemination and demo events and publications. An important milestone has been achieved by launching the new AVATAR-vessel. AVATAR project partners started with preparations of the AVATAR final event (Newsletter 6).

Read more here: AVATAR website, LinkedIn

AVATAR @ AUTOBARGE EVENT

Picture: AUTOBARGE

30.03.2023 – Project partner Thomas Brauner (Logistics Initiative Hamburg) participated at the MSCA ETN AUTOBarge event (Rotterdam) on European training and research on autonomous barges for smart inland shipping.

Read more here: AVATAR website, AVATAR Linkedin, AUTOBARGE website

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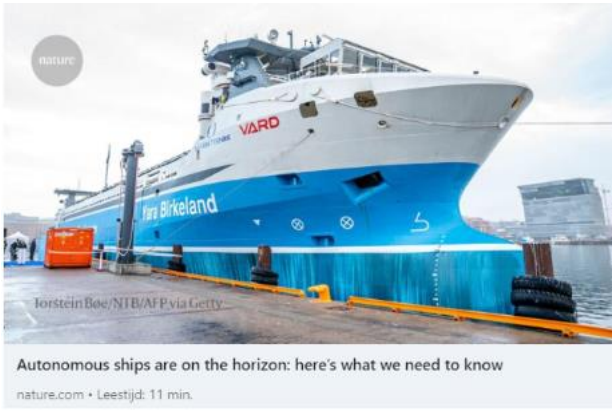
Project partners contributed to a Nature article on autonomous ships



02.03.2023 – AVATAR project partners Rudy Negenborn (TU Delft | Mechanical Engineering) and Peter Slaets (KU Leuven) contributed to a Nature article on autonomous ships.

Research gaps in six key areas are described:

(i) understanding the challenges at different levels of autonomy;
(ii) defining the role of humans;
(iii) assuring safety and security;
(iv) rethinking ports;
(v) embedding autonomy in legal and regulatory frameworks;
(vi) setting out the case for autonomous ships.

Read more here: AVATAR website, AVATAR Linkedin, Article in Nature

AVATAR @ German Society of Transport Sciences

Picture: LIHH

13.03.2023 - Project partner Logistics Initiative Hamburg was invited to present innovative last mile distribution concepts on the waterways during the event (7/3/2023) of the German Society of Transport Sciences (Deutsche Verkehrswissenschaftliche Gesellschaft (DVWG) e.V.), taking place at HSBA Hamburg School of Business Administration.

Transport scientists, experts and students were informed about the AVATAR concept and its application in follow-up pilots such as the DECARBOMILE project, in which the defined use case of last mile parcel delivery will be piloted together with Deutsche Post und DHL.

Read more here: AVATAR website, AVATAR Linkedin, DVWG, HSBA Hamburg School of Business Administration, DECARBOMILE project,

Deutsche Post und DHL

AVATAR Demonstration event – Maverick KU Leuven

Picture: Tom Pauwels

26.04.2023 – The Intelligent Mobile Platforms research group at KU Leuven organized an AVATAR demonstration event showing the catamaran vessel named the "Maverick". In the AVATAR Interreg North Sea Region project on highly autonomous sailing and city freight distribution, several demonstrations of the new developed technologies are foreseen.

The KU Leuven catamaran vessel Maverick was demonstrated in Leuven on the 20th of April. At this event, the Intelligent Mobile Platforms research group presented the hardware and software architecture of the vessel, and demonstrated the vessel's sailing and manoeuvring behaviour. Furthermore, basic automated behaviour of the vessel was demonstrated by means of following waypoints over a 500m trajectory at the Vaart in Leuven. As such, this automated waypoint follower showed a first, realtime autonomy integration between the external sensor box and the vessel.

The Intelligent Mobile Platforms research group at KU Leuven developed a catamaran vessel named the "Maverick" within the European Interreg project AVATAR. The vessel is equipped with two fully-electric 360 degree rotating propellers. The Maverick can carry a load of one tonne, and is moreover equipped with multiple balancing tanks. The vessel can be controlled manually, remotely (from a remote control centre), and by means of an onboard computer using control software that can automate various navigation tasks of the Maverick. The vessel has limited hard-integrated onboard sensors, and instead seemingly integrates with an external sensor box that combines advanced sensors such as LiDAR, cameras, GNSS, and IMU. As such, the Maverick's main intelligence component is this external sensor box that can communicate with the actuation system of the vessel.

Read more here: AVATAR website, AVATAR Linkedin (including a video), KUL Intelligent Mobile Platforms research group

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AVATAR – LIHH LOGISTIK Report 2022/2023

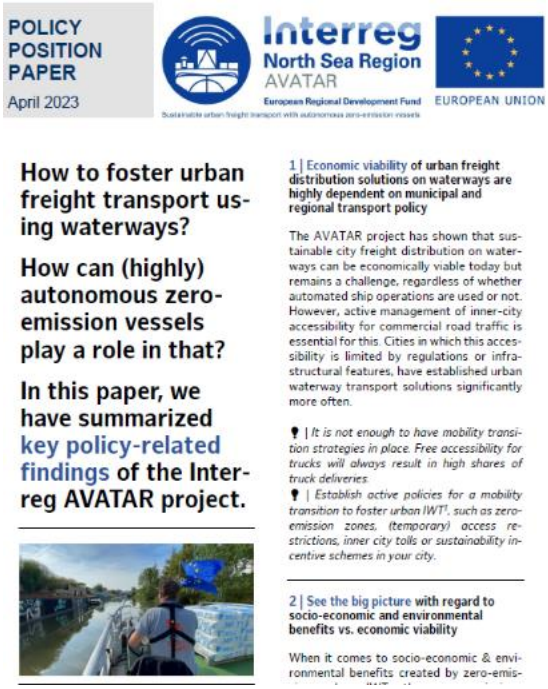
Picture: LIHH

13.04.2023 – Project partner Logistics Initiative Hamburg has published their annual report called "LOGISTIK Report 2022/2023". In this report (in German language), digitally available *here*, you can also find an article about the AVATAR project (page 25), as well as an article about the DECARBOMILE-project (page 16), which has been elaborated in cooperation with AVATAR.

The LOGISTIK Report has a broad reach into the whole logistics community in Hamburg, Northern Germany and beyond. Through its print and digital channels it reaches more than 80.000 views & impressions by logistics experts, researchers, politicians, administrations as well as the general public.

Read more here: AVATAR website, AVATAR Linkedin, LIHH Logistik Report 2022/2023

AVATAR Policy Position Paper



Picture: AVATAR

04.05.2023 – How to foster urban freight transport using waterways? How can (highly) autonomous zero-emission vessels play a role in that?

AVATAR project partners Logistics Initiative Hamburg and POM Oost-Vlaanderen have created a Policy Position Paper. Key policy-related findings of the AVATAR project have been summarized.

In the AVATAR Policy Position Paper, 8 key issues are included that governance actors need to address in particular to advance city freight distribution via waterways and highly autonomous inland navigation.

The paper is available here.

Read more about the following 8 topics:
1. Economic viability of urban freight distribution solutions on waterways are highly dependent on municipal and regional transport policy;
2. See the big picture with regard to socio-economic and environmental benefits vs. economic viability;
3. Infrastructure needs to be in shape;
4. Autonomous (inland) shipping needs a legal framework;
5. Liability frameworks need to be revised for autnomous (inland) shipping;
6. Pilots, pilots, pilots;
7. Leading by example - Cities need to get active with their own use cases;
8. Bureaucracy and fragmented responsibilities prevent the implementation of innovative solutions.

The AVATAR Policy Position Paper has been presented at the GATEWAY HAMBURG stand during the transport logistic exhibitions in Munich by Thomas Brauner on 9th & 11 May 2023.

Read more here: AVATAR website, AVATAR Linkedin, AVATAR Policy position paper

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AVATAR @ Transport Logistic Exchibitions 2023

Picture: LIHH

09.05.2023 – AVATAR Interreg North Sea Region was part of the GATEWAY Hamburg stand (transport logistic exhibitions) of Logistik-Initiative Hamburg. AVATAR was present at the transport logistic exhibitions trade fair and conference, taking place in Munich, Germany, from 9 to 12 of May 2023. As part of the Gateway Hamburg stand of project partner Logistics Initiative Hamburg, a presentation was shown about the potentials of (highly) autonomous and urban zero emission Inland waterway transport for the last mile distribution (presentation at the Innovators' Wall on Gateway Hamburg booth). During this event, the AVATAR policy position paper has been presented.

Read more here: AVATAR website, AVATAR Linkedin, LIHH website

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New milestone! Vessel launching

Picture: Tom Pauwels

12.05.2023 – It was an exciting day for the AVATAR project with the launch of the new AVATAR vessel in the water on 10/5/2023. The new vessel will be used as test vessel for city freight distribution (25 ton load capacity, zero-emission, highly automated).

The AVATAR vessel performed the first miles in the water, and will be followed by a period of intense testing. ⊙ ⊙ ⊙ Congratulations to Peter Geirnaert, the team of E. VAN WINGEN NV and SEAFAR!!

Read more here: AVATAR website, AVATAR Linkedin

Webinar on Hamburg's transport and sustainability strategies

Picture: LIHH

02.06.2023 – On June 2, 2023, project partner Logistics Initiative Hamburg had the pleasure of hosting the AVATAR Webinar: How do Hamburg's transport & sustainability strategies align with the AVATAR concept of zero emission urban inland waterway transport? - An analysis.

Mrs. Claudia Schlösser, in cooperation with the Logistics Initiative Hamburg and the AVATAR project, presented the results of her research: *An analysis of synergies and conflicts of goals between the AVATAR project and strategies from the areas of Last Mile delivery, sustainability and mobility transition relevant for the Free and Hanseatic City of Hamburg*.

On the basis of a qualitative content analysis (using 16 policy documents), it has been concluded that the AVATAR project can make a strong contribution to Hamburg's agenda. As well the City

of Hamburg as the AVATAR project focus on sustainable urban freight distribution, avoiding emissions and nuisance for local residents. It has also been noted that biggest barriers consist of infrastructural issues, bureaucracy and fragmented responsibilities.

Read more here: AVATAR website, AVATAR Linkedin, LIHH website, Presentation

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Remote control test KUL and UOL

Picture: UOL and KUL

05.06.2023 – A successful remote control test was performed by KU Leuven and Carl von Ossietzky Universität Oldenburg.

At the end of March 2023, a successful remote control test was performed by KU Leuven and Carl von Ossietzky Universität Oldenburg. The remote control center, developed by the University of Oldenburg, controls remotely the KU Leuven catamaran vessel Maverick at the Vaart in Leuven.

The developed remote control center was designed independently of the ship which must be controlled and through an abstraction layer, different ships can be connected to and steered by the remote control center.

Read more here: AVATAR website, AVATAR Linkedin (including a video)

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Get to know the project partners. E. Van Wingen and OHB

www.vanwingen.be

Picture: E. Van Wingen

E. Van Wingen (EVW) is a leading manufacturer specialized in power solutions for emergency power and cogeneration units (natural gas, biogas, biomass), always emphasizing engineered solutions tailored to the customer. As a manufacturer and supplier of power solutions we closely follow the latest trends in energy efficiency, sustainable and decentralized power generation.

E. Van Wingen strongly believes in engaging corporate social responsibility (CSR) and it has become an integral part of our quality strategy. Our CSR policy is an extension of our already existing quality management (ISO 9001) and safety (VCA**) management systems. Being "SDG-champion" further strengthens our focus on CSR and sustainability. The UN's Sustainable Development Goals are guiding us towards a permanent pursuit of greater sustainability and social responsibility, by and for all our stakeholders.

This way of thinking has led EVW to develop an H2 ICE CHP (= hydrogen internal combustion engine for combined heat and power) , also known as the EVW hydrogen powered cogeneration unit that is a circular chain solution and is facilitating the energy transition. The cocktail features 100% renewable energy and water, 0 gr CO2, supreme energy efficiency, the link between energy vectors and mobility, local employment worldwide, reuse of recycled materials, long and repeated life cycles, energy independence. EVW's aim is to link energy flows like electricity, heat, cooling, mobility at 0 gram CO2 and 100% recycle. The EVW's hydrogen powered ICE CHP has been awarded the "Solar Impulse Efficient Solution" label, a proof of high standards in profitability and sustainability.

Not only is EVW investing in hydrogen powered cogeneration units via an internal combustion engine, EVW is also investing in hydrogen powered genset using fuel cell technology. The cooperation agreement with German based company CBC GmbH&Co KG is paving the path for prototype design and development of the autonomous hydrogen powered genset using fuel cell technology in the power range of 50-60 kWe. This development will entitle EVW the first genset manufacturer in the EU to produce industrial mains failure sets and CHP units, applying both ICE (internal combustion engine) and FC (fuel cell). Being committed to continuously engage in innovation and with the unique knowhow in this field, EVW has been selected as the ideal partner

by CBC GmbH & Co KG to engage in the joint development of this new step towards the energy transition. ICE & FC gensets, whether or not for combined heat and power generation, are complementary solutions to efficiently transform energy stored in H2 into sustainable electric power and heat.

For a fifth year in a row, EVW received the VOKA Charter for Sustainable Entrepreneurship in recognition of our policy on CSR in which sustainability is key. Project AVATAR has received particular attention among the Best Practices highlighted by VOKA. This brings us to our role in AVATAR which is mainly the Energy Use Case. The AVATAR autonomous zero-emission vessels sailing on green energy will be deployed for inland waterways distribution. Batteries are the power source of the AVATAR vessels. The electrically powered vessels will not run on electricity from nuclear power stations nor on electricity from fossil fuels as that would be contradicting the word 'green energy'. The AVATAR vessels will run on power from renewable energy sources (green energy) by storing green energy in hydrogen. The hydrogen will be the fuel for the EVW's hydrogen generator that will eventually charge the batteries of the AVATAR vessels. Since we do not have the luxury of an excess of green energy, we need to make sure that we put the in hydrogen converted green energy to good use. This role is reserved for the H2 ICE CHP, which is still the highest performing energy transformer. By producing and consuming locally, we reduce losses and work even more efficiently by optimizing locally. The Energy Use Case is a total energy solution providing energy security whilst produced locally, independent of the grid. Using electricity from the grid will not suffice as it will lead on the one hand to net congestion and on the other hand the existing cables (and the whole electrical infrastructure including transformer cabins etc.) will have to be enlarged significantly to comply with the needed energy for the batteries of the AVATAR vessels which involves a significant amount of extra costs regarding infrastructures. Curious to find out more? Read the published document 'Energy Use Case'.

Read more here: E. Van Wingen

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HOUT & BOUW
OPLEIDINGSCENTRUM

Picture: OHB

OHB is an expert group and training centre for city logistics and distribution of construction material. They envisage autonomous sailing the next step to functional city distribution in Ghent. They are a Private-Public Co-operation (PPS) with Ghent and actively coordinating city distribution for construction materials with multiple vendors in this region.

By means of gaining knowledge and exchanging knowhow on testing and implementation of the validated concepts regarding autonomous shipping, OHB aims to translate this expertise into other regions as they are currently talking with policy makers and constructions companies. Based on previous dialogues with local authorities and shipowners, they realized the critical need for a operational test bed and appropriate demonstrators.

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About the Interreg AVATAR project

AVATAR – Autonomous vessels, cost-effective transhipment, waste return. AVATAR is a project co-funded by the INTERREG North Sea Region Programme 2014 - 2020.

The AVATAR project aims to tackle challenges of city freight distribution by developing, testing and assessing adequate technologies and business models for urban autonomous zero-emission IWT. Through this, the project unlocks the economic potential of urban vessels and corresponding waterways, increases available solutions for full-cycle automation and sets up a sustainable supply chain model for urban goods distribution and waste return.

Further information and project news can be found on the project website and LinkedIn

https://northsearegion.eu/avatar

https://www.linkedin.com/company/avatar-interreg-north-sea-region

A general status of the project is available via this *link*.

Contact for queries

To get in touch with AVATAR, please contact the lead beneficiary organisation.

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