



AUTOBARGE PROJECT

ESR13 – MODELLING THE ECONOMIC IMPLICATIONS OF THE ADOPTION OF AUTONOMOUS INLAND SHIPPING



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AUTONOMOUS BARGES FOR SMART INLAND SHIPPING

A MARIE SKLODOWSKA-CURIE ACTIONS (MSCA) INOVATIVE TRAINING NETWORKS (ITN) H2020-MSCA-ITN-2020



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Dhaneswara Al Amien is currently working as a Early Stage Researcher (ESR) at the NORD University with research on An Agent-Based Modeling Approach to Autonomous Shipping Adoption in Inland Shipping

AFFILIATIONS

This project is part of EU Framework Programme for Research and Innovation Horizon 2020

INTRODUCTION

According to the European Commission, passenger transport is projected to increase 42% by 2050, and freight transport up to 60%. Needless to say, this puts an enormous burden on transport networks and our environment.

Compared to other modes of transport – which often face congestion and capacity problems – inland waterway transport is characterised by reliability, energy efficiency and a capacity for increased use. More than 37,000 km of waterways connect hundreds of cities and industrial regions in Europe. In the EU, 13 countries share an interconnected waterway network, highlighting the potential for increasing the modal share of inland waterway transport.

This will not happen unless we can make inland waterways economically competitive. However, with crew costs accounting for 60% of the total cost, autonomous inland vessels represent an exciting disruptive technology.

OBJECTIVE

The European training and research network on Autonomous Barges for Smart Inland Shipping (AUTOBarge) will:

- Build-up a highly skilled workforce for the autonomous inland waterway transport sector;
- Further develop the essential building blocks of the SUDA-model of an AV (Sense the environment, Understand the environment, Decide about the next action/maneuver to take, Act according to that decision) that are needed for an autonomous vessel to take over the role of the human captain and crew;
- Address the many other socio-technical, logistic, economic, and regulatory conditions that need to be met for the successful and future-proof implementation of autonomous vessels in the inland-waterway transport sector.

ESR13 - WP3 AT NORD UNIVERSITY

Whereas WP1 and WP2 focused on the underlying technologies needed to develop and use autonomous vessels within inland waterways, there are many other fundamental hurdles to be overcome before autonomous inland shipping will be broadly adopted. WP3 is the Socio-Technical, Economic and Legal Aspects of the project.

ESR13 will look at the economic side and focus on the question:

“Under which conditions will autonomous inland shipping be broadly adopted by the current actors in the inland waterway ecosystem and give the most economic benefit?”

ESR13 will develop an Agent-Based Model for the economic implications of the adoption of autonomous inland shipping.

RESEARCH WORK PACKAGES

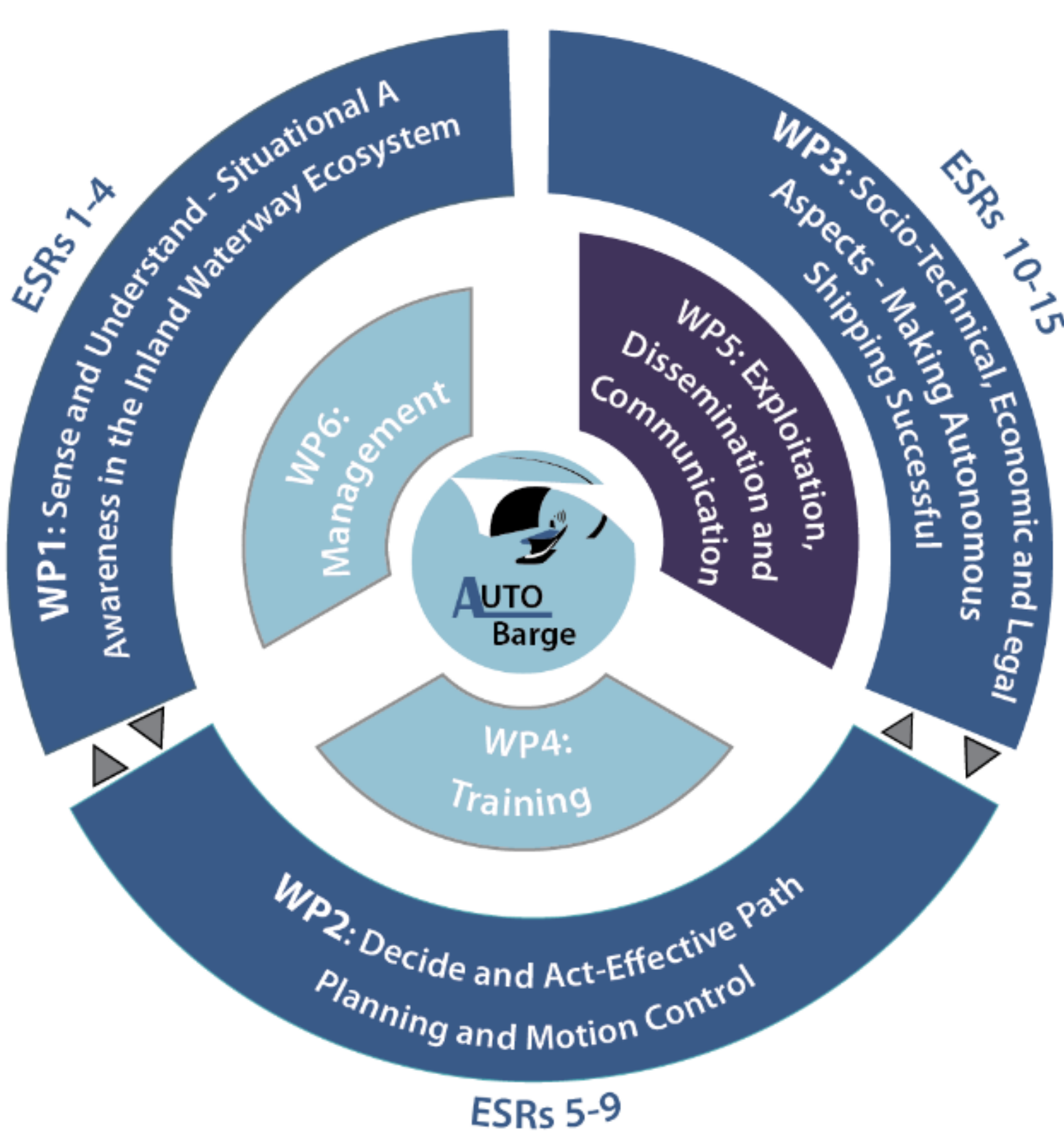


FIGURE 1. AUTOBARGE WORK PACKAGES

PROJECT PARTNERS

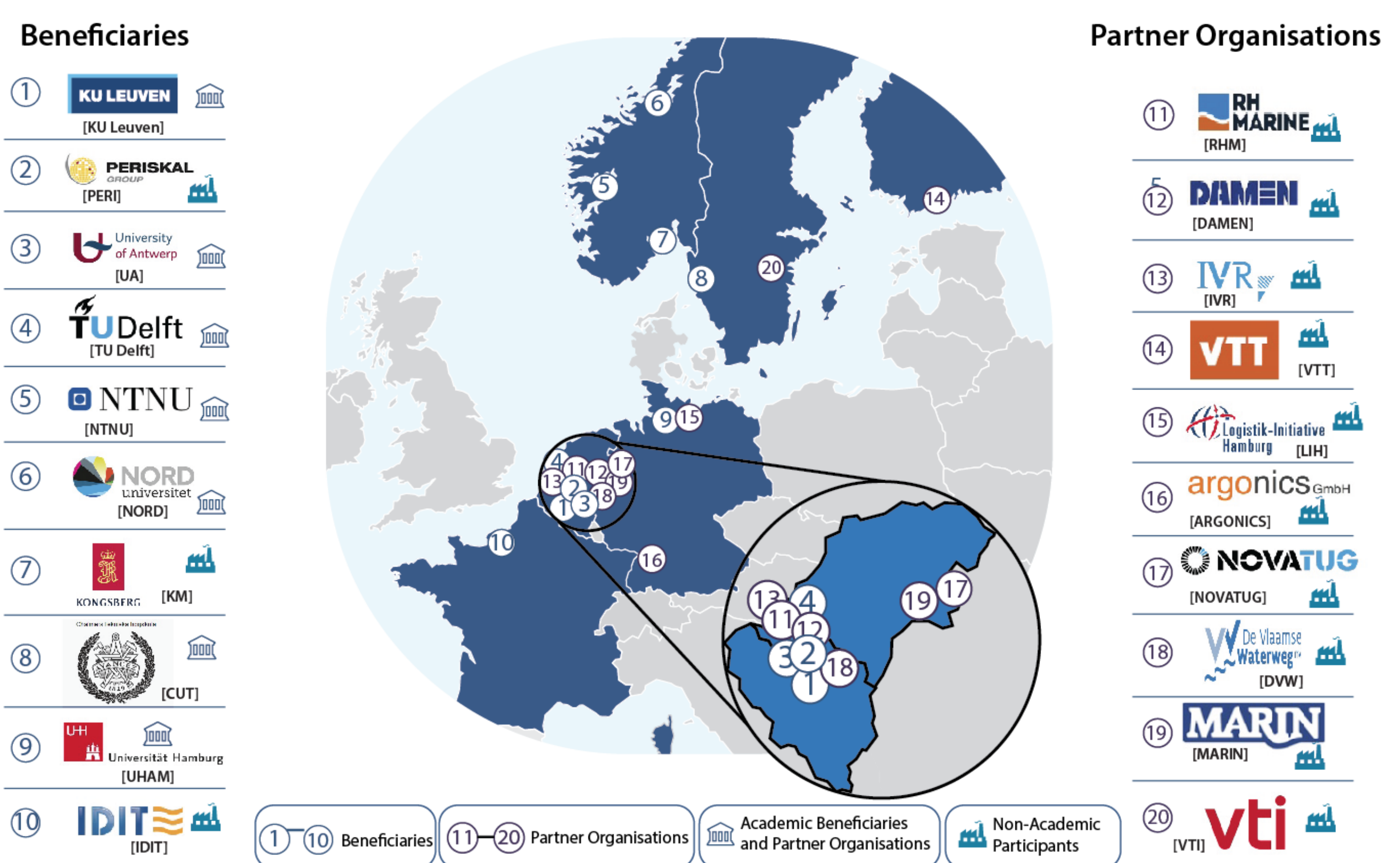


FIGURE 2. PARTICIPANTS IN THE AUTOBARGE PROJECT

FIRST PAPER

Diffusion of Innovation Framework of the autonomous inland shipping

- Theory : Diffusion of Innovation (Rogers, 1962)
- Method : Literature Review
- Data source : Web of Science, Scopus, and Clarksons datasets

SECOND PAPER

Understanding shipowners' behavior towards autonomous inland shipping innovation

- Theory : Theory of Planned Behaviour
- Method : Quantitative, Partial Least Squares Path Modeling (PLS-PM)
- Data source : Literature review, survey with inland shipowners, and Scopus and Clarksons datasets

THIRD PAPER

How different factors affect the diffusion of autonomous inland shipping?

- Theory : Complex system
- Methodology : Simulation, Agent Based Modelling with NetLogo and/or Python-Mesa
- Data source : Literature review, survey with inland shipowners (optional)

<https://etn-autobarge.eu/>