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|---------------------------|--|-----------------|-----------|
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D8.2 - PUBLIC PROJECT WEBSITE

| | | | |
|------------------------------|--------------------------|----------------------|------------|
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| 0.1 | 27/03/2023 | Manuela Guiducci (PNO) | Set up of document and content |
| 1.0 | 31/3/2023 | Alexandros Rammos (NTUA) | Document review and finalisation |

TABLE OF CONTENTS

| | | |
|-----|--|----|
| 1 | INTRODUCTION | 4 |
| 2 | PROJECT PUBLIC WEBSITE | 5 |
| 3 | SEAMLESS WEBSITE MENU..... | 8 |
| 3.1 | 'SEAMLESS' | 8 |
| 3.2 | 'CONSORTIUM' PAGE..... | 12 |
| 3.3 | METHODOLOGY..... | 13 |
| 3.4 | 'DEMO & TRANSFERABILITY CASES' PAGE..... | 14 |
| 3.5 | 'NEWS & PRESS' PAGE..... | 16 |
| 3.6 | 'EVENTS' PAGE | 16 |
| 3.7 | 'PUBLIC DOCUMENTS' PAGE..... | 17 |
| 3.8 | 'RELATED PROJECTS' PAGE..... | 17 |
| 3.9 | 'CONTACT US' PAGE | 19 |
| 4 | CONCLUSIONS..... | 20 |

LIST OF FIGURES

| | |
|--|----|
| FIGURE 1: SEAMLESS WEBSITE HEADER..... | 5 |
| FIGURE 2: SEAMLESS WEBSITE FOOTER | 6 |
| FIGURE 3: SEAMLESS WEBSITE HOMEPAGE..... | 7 |
| FIGURE 4: SEAMLESS WEBSITE MENU..... | 8 |
| FIGURE 5: THE PROJECT PAGE..... | 9 |
| FIGURE 6: OBJECTIVES PAGE | 10 |
| FIGURE 7: IMPACTS PAGE..... | 11 |
| FIGURE 8: WORKPLAN PAGE..... | 12 |
| FIGURE 9: CONSORTIUM PAGE | 13 |
| FIGURE 10: METHODOLOGY PAGE | 14 |
| FIGURE 11: DEMO & TRANSFERABILITY CASES PAGE | 15 |
| FIGURE 12: NEWS & PRESS PAGE..... | 16 |
| FIGURE 13: EVENTS PAGE..... | 16 |
| FIGURE 14: PUBLIC DOCUMENTS PAGE | 17 |
| FIGURE 15: RELATED PROJECTS PAGE | 18 |
| FIGURE 16: CONTACT US PAGE..... | 19 |

List of Abbreviations

| Abbreviation | Definition |
|---------------------|---------------------------------|
| D&C | Dissemination and Communication |
| CMS | Content Management System |

1 INTRODUCTION

Deliverable D8.2 Public Project Website deals with the SEAMLESS website created at the beginning of the project and conceived as the main D&C tool to make available to visitors, namely the general public, project results and the latest developments, as well as creating a place for project partners to share information and news and archive all the public documents that will be produced in the frame of SEAMLESS.

2 PROJECT PUBLIC WEBSITE

The website has been developed and launched by PNO in March 2023 (M3), using WordPress as CMS.

The SEAMLESS website - available in English at the link <http://seamless-project.eu/> - will play an essential role in the overall dissemination strategy of the project, as it will allow to make available to visitors project results and the latest developments.

By making project results and developments easily accessible to the public, the website will help increase awareness and understanding of the project's goals and achievements. Additionally, by providing a platform for project partners to share information and news, the website can foster collaboration and communication among the project team, which can ultimately lead to more successful outcomes.

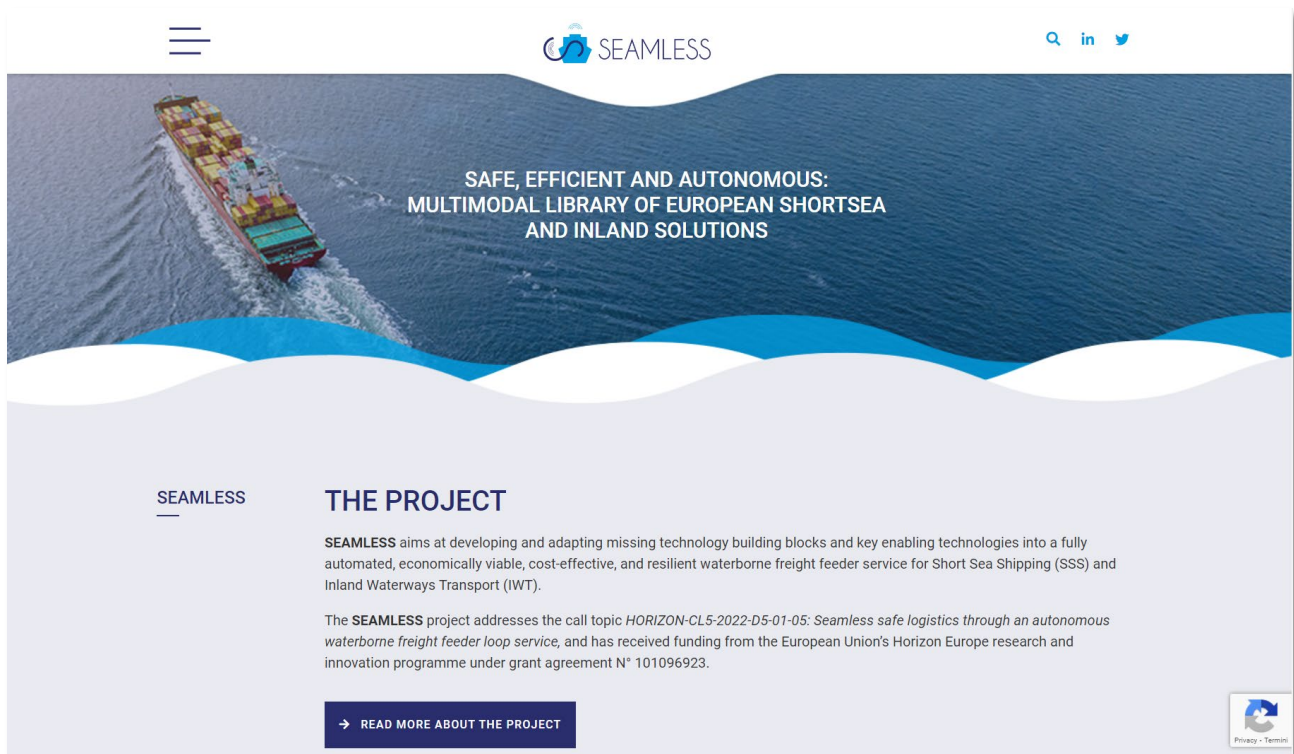


Figure 1: SEAMLESS website header

The footer of each page of the website clearly displays the links to the “Get in Touch With Us” and the “Newsletter” pages. In addition, the footer also shows the EU flag and the text stating the funding of SEAMLESS as Horizon Europe project appears, like below reported, with the disclaimer:

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

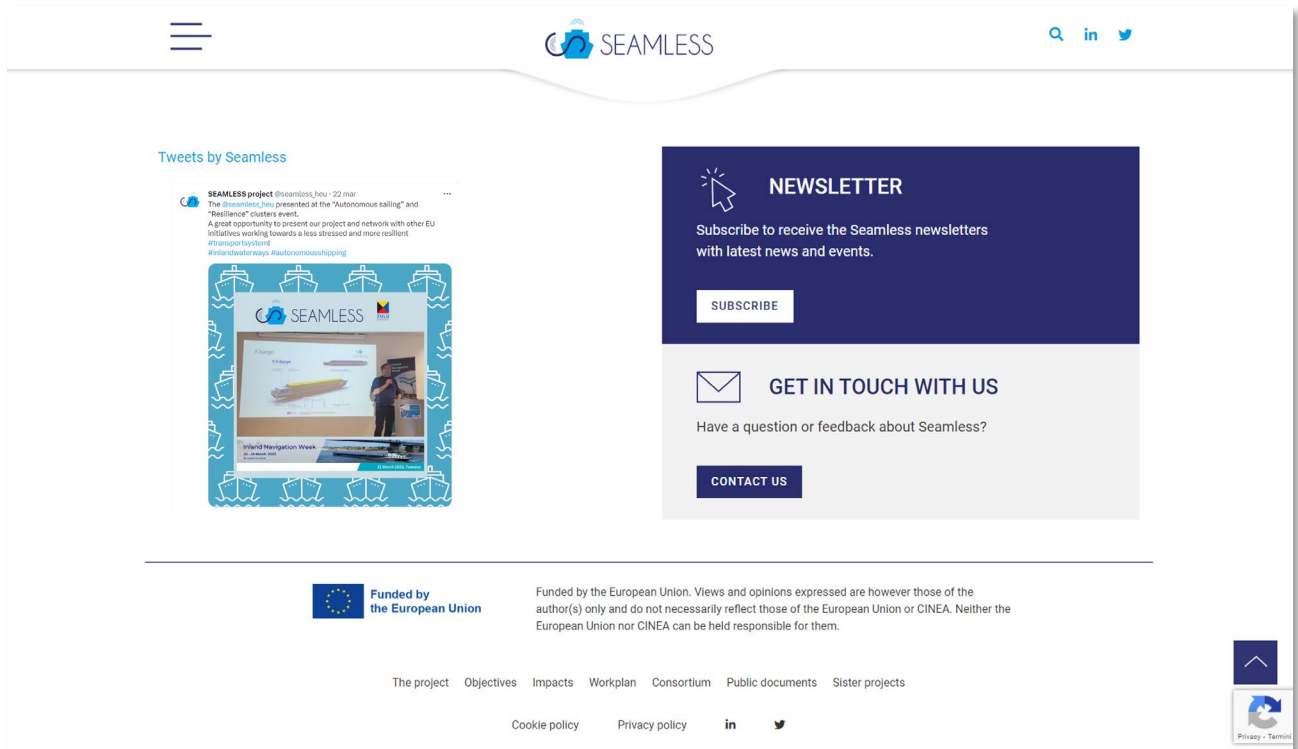


Figure 2: SEAMLESS website footer

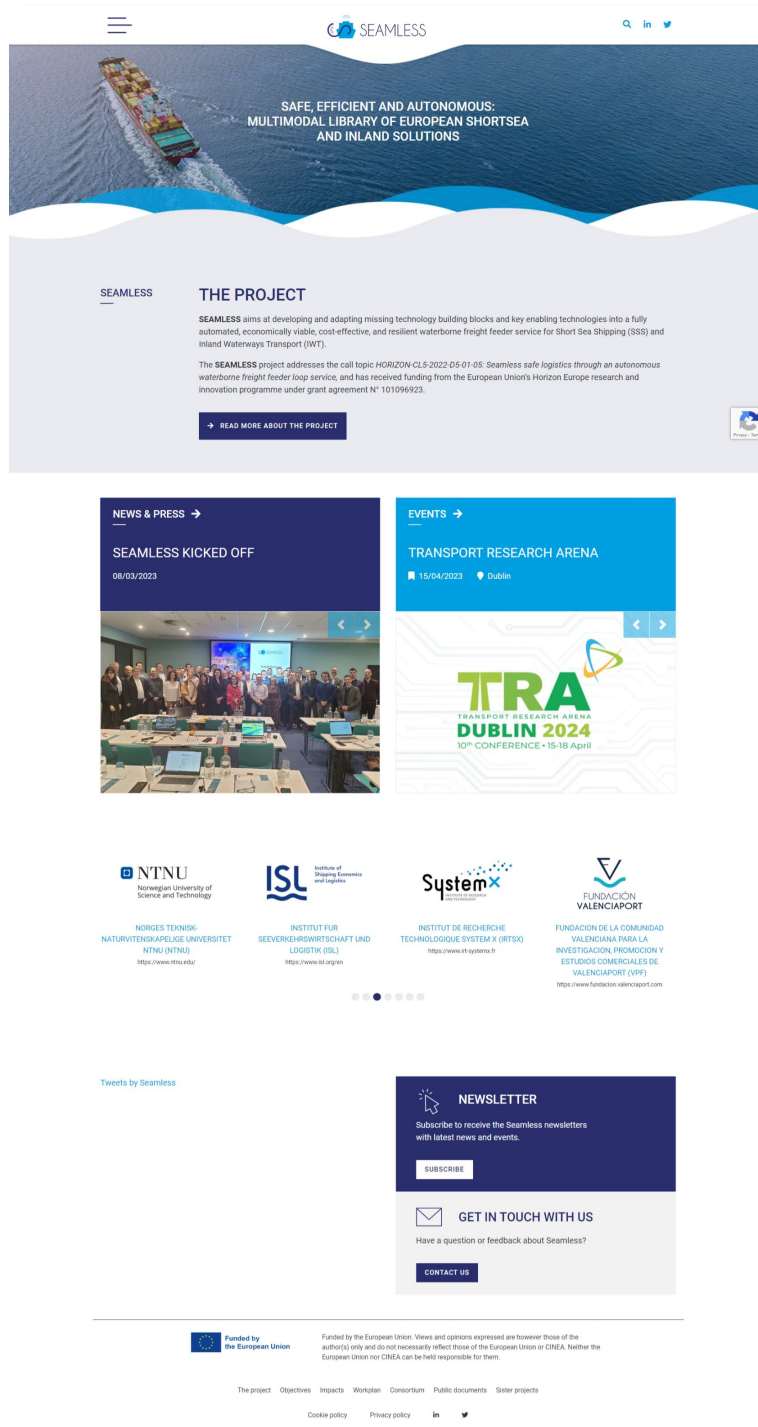


Figure 3: SEAMLESS website homepage

3 SEAMLESS WEBSITE MENU

The website menu has been structured in the following sections:



Figure 4: SEAMLESS website menu

3.1 'SEAMLESS'

The "SEAMLESS" page includes four sub-pages:

- **The Project**, which provides a description of SEAMLESS and its aim.
- **Objectives**, to describe the specific project objectives of the project.
- **Impacts**, to define the key outcomes expected by SEAMLESS and the impacts beyond the end of the project.
- **Workplan**, which offers an overview on the activities that will be carried out in the frame of SEAMLESS, and by which partners.

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THE PROJECT

SEAMLESS aims at developing and adapting missing technology building blocks and key enabling technologies into a fully automated, economically viable, cost-effective, and resilient waterborne freight feeder loop service for Short Sea Shipping (SSS) and/or Inland Waterways Transport (IWT).

Autonomous systems will be integrated to ensure safe, resilient, efficient, and environmentally friendly operation to shift road freight movements to hinterland waterways, while enhancing the performance of the TEN-T network. The service will be delivered 24/7 by a fleet of autonomous cargo shuttles, with humans-in-the-loop located in Remote Operation Centres (ROCs), which efficiently cooperate with automated and autonomous shore-side infrastructure and safely interact with conventional systems.

The services will rely on a redesigned logistics system enabling seamless freight flows by minimising delays at intermodal nodes. A digital bird's-eye view of the supply chain allows the exploitation of real-time information for planning optimisation and reconfiguration to support resilient logistics, incl. digitalised administrative procedures.

The **SEAMLESS** building blocks will be verified and validated by conducting full-scale demonstrations in selected real-world scenarios. Transferability will be fully demonstrated in selected use cases that cover a wide range of transport applications and geographical regions throughout Europe. Based on a structured methodological framework evaluating sustainability criteria, they will act as guidance for the replication of the project results beyond the project scope and time-span.

Novel business models will be thus developed and provide a framework for implementing the **SEAMLESS** service to minimise investment risk for first movers. Regulatory gaps and challenges related to autonomous vessel operation (e.g., social aspects) will be identified, and recommendations for policy makers to allow the smooth and safe deployment of fully automated services will be provided.

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Figure 5: The project page

OBJECTIVES

SEAMLESS will develop and adapt missing building blocks and enablers into a fully automated, economically viable and cost-effective, waterborne freight feeder loop service for SSS (Short Sea Shipping) and IWT (Inland Waterways Transport). SEAMLESS will develop and integrate autonomous systems in a way that ensures safe, resilient, efficient, and environmentally friendly operation to shift road freight movements towards waterways.

BUILDING BLOCKS

- B1 & B2**
SEAMLESS services will be delivered by tailored autonomous cargo shuttles, which will operate 24/7 with humans-in-the-loop located in remote control centres. The autonomous vessels will efficiently cooperate with automated and autonomous shore-side infrastructure (incl. docking and cargo handling at port) and safely interact with conventional, manned systems in the supply chain.
- B3**
SEAMLESS services will be based on a redesigned logistics system that will facilitate seamless freight flows through the supply chain by minimising delays in intermodal nodes (i.e., where waterborne and land-based transport modes are connected). This includes a SEAMLESS digital "bird's-eye" view of the supply chain, that allows the exploitation of real-time information (incl. from SEAMLESS physical assets), for planning optimisation and reconfiguration to support resilient logistics.

ENABLERS

- E1 & E2**
SEAMLESS will verify and validate the building blocks involved in the feeder service by conducting full-scale demonstrations in selected real-world scenarios, by combining physical and digital assets developed in the project with assets provided by the Consortium. SEAMLESS will also demonstrate transferability in selected use cases that cover a wide range of transport applications and geographical regions with different requirements throughout Europe. Based on a structured methodological framework that will evaluate sustainability criteria (local and wider levels), they will act as guidance for the replication of the project results beyond the project scope and time-span.
- E3**
SEAMLESS will develop novel business models that will provide a framework and pathways for practically implementing the SEAMLESS service with the goal to minimise of minimizing investment risk for first movers. SEAMLESS will also identify gaps and challenges in the current regulatory framework related to autonomous vessel operation and provide recommendations for policymakers to allow the smooth and safe deployment of fully automated services.

Figure 6: Objectives page

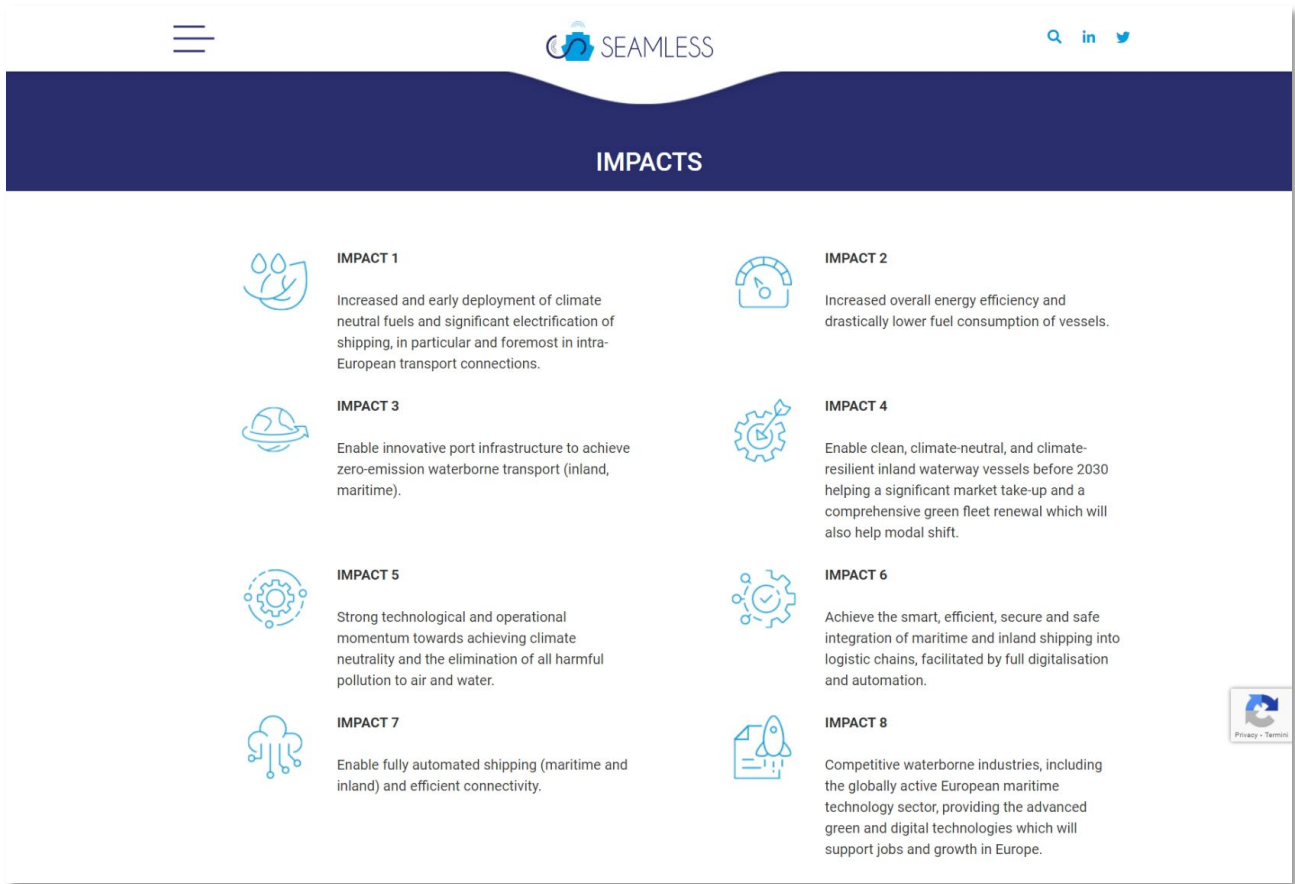


Figure 7: Impacts page

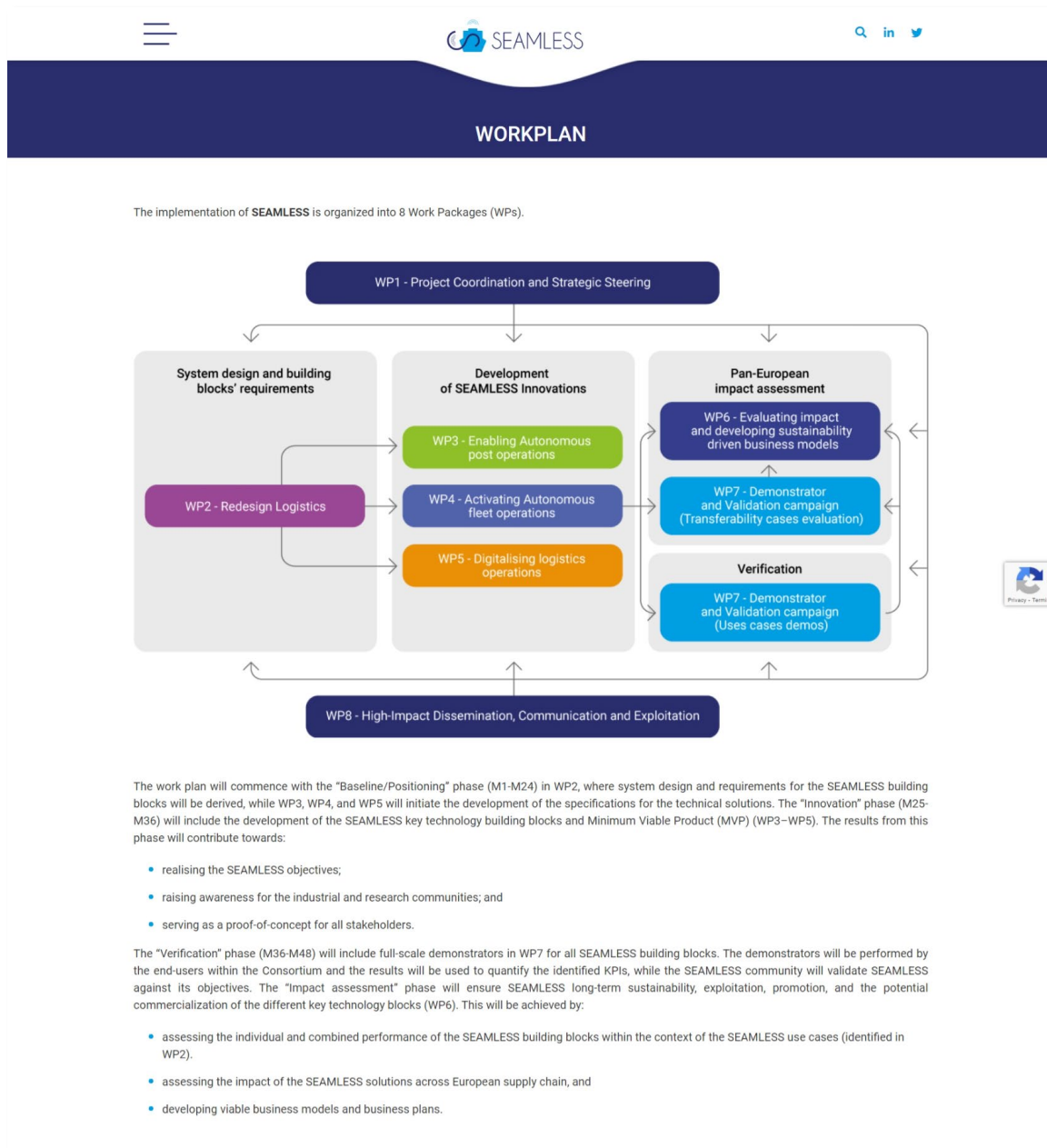


Figure 8: Workplan page

3.2 'CONSORTIUM' PAGE

The "Consortium" page offers a description of all the organizations involved in SEAMLESS and the role they play within the project, and it displays their corporate logo and link to the corporate website.



Figure 9: Consortium page

3.3 METHODOLOGY

This page provides details on the methodology used to redesign the logistics system to support seamless, safe, synchromodal, resilient cargo transport with improved efficiency for servicing the hinterland.

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METHODOLOGY

SEAMLESS aims to demonstrate to the transport community that autonomous feeders can solve today's transport problems and overcome any real and perceived obstacles. **SEAMLESS** will achieve this by developing three missing building blocks and integrate them with already existing results from other projects into a fundamentally new concept for fully automated waterborne freight feeder loop service for SSS and IWT. The **SEAMLESS** enablers will then be used to document the positive effects of the new systems and to provide a roadmap for technical and policy initiatives.

To accommodate the integration of autonomous and automated technologies in the supply chain, **SEAMLESS** will redesign the logistics system to support seamless, safe, synchromodal, resilient cargo transport with improved efficiency for servicing the hinterland.

The scope of **SEAMLESS** within the supply chain includes:

- cargo handling, from ship-shore and within the port, at intermodal SSS and IWW ports with other maritime and hinterland connections (i.e., trucks and rail)
- loop transportation of various cargoes (incl. containers with RoRo and LoLo, bulk cargo) between SSS-IWW or IWW-IWW ports,
- information flow throughout the supply chain with respect to the transportation means, the cargoes, and the supporting shore-side infrastructure.

Within its scope, **SEAMLESS** will develop innovations towards minimising bottlenecks and delays in the following three interconnected layers:

1. Physical Assets,
2. Logistics System, and
3. Digital Assets.

Figure 10: Methodology page

3.4 'DEMO & TRANSFERABILITY CASES' PAGE

The 'Demo & Transferability Cases' page provides descriptions of SEAMLESS building blocks to be developed in the frame of the project. It also provides explanations of the transferability cases to be examined and evaluated.

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DEMO & TRANSFERABILITY CASES

Demonstration UCs

All SEAMLESS building blocks, as well as the fully integrated version of the technological ecosystem, will be verified and validated through the SEAMLESS Use Cases, which are divided into:

- two full scale demonstrations in real-world conditions for SSS and IWT, which aim to verify the target TRL for the SEAMLESS building blocks, and
- five transferability use cases, which aim for the replicability of the SEAMLESS business models and assess the impact of the SEAMLESS service concept throughout different regions of Europe.

| | UC #1: Northern Europe (SSS) | UC #2: Central Europe (IWT) |
|----------------------------------|--|---|
| Location | | |
| Challenge/Motivation | <p>The Port of Bergen, which is Norway's second largest port in tonnage and currently located within city limits, is expected to be moved in Agdenes. A smaller cargo terminal will be operated in Bergen and cargo is expected to be transported through a 26km driving distance with roads and bridges, which will need to be extensively improved to handle the increase in truck traffic. To minimise cargo transport through trucks between the two ports, currently there are plans for using a manned 60 TEU feeder vessel. In 2030 it is estimated that these feeder loops will need to handle an annual volume of 23,000 TEU.</p> | <p>Modal equilibrium remains an unresolved problem for Europe. Even though the EU has been trying to address this predicament since 2001, the modal shift towards IWT has been unsuccessful to date. The main barriers of adopting IWT are rooted in consignors designing supply chains without any IWT legs (partly despite its cost attractiveness), adverse contractual terms, a disadvantageous market structure with few big operators and many small ones, limited political support of the transport mode, lack of digitalization and clearance profile restrictions at bridges, locks, and fairways. Additional barriers include the heavy burden of administration at border crossings, exacerbated by inconsistencies in the process.</p> <p>The routes accommodate existing container flows through conventional IWT services.</p> |
| Approach | <p>The UC involves a potential future system of three feeder loops serving the city of Bergen:</p> <ul style="list-style-type: none"> a direct feeder loop between Bergen and Agdenes (green road, 22 nm), northern hinterland (blue, 115 nm) and southern hinterland (red, 68 nm). <p>The demonstration will involve ASICO's highly automated, fully electric RORO vessels, which are currently being built and are intended for operation in the Oslo fjord. These vessels are expected to be put in service in 2022 (E3), and sail without crew by 2025. The route that will be involved is the Tron (1.0h) between Agdenes and Bergen (or an equivalent route with similar conditions).</p> <p>The activities will include the following SEAMLESS building blocks: port operations; mooring, shore connection and charging, cargo (un)loading to RORO and Containers; the communication between ROCS; autonomous functionality in sheltered waters and heavy traffic; and verification of operational constraints such as weather/windows, tide, etc., and full utilisation of the ModANET modules.</p> | <p>This UC will demonstrate that a loop service comprised of a fleet of small (e.g. with up to 80 TEU, highly automated, zero emission vessels supervised by humans) in the loop in ROCS on a 24/7 basis, have the potential to reinforce modal shift towards IWT. The demonstration will use ZULU Barge design, which is a highly automated, inland container barge carrying up to 80 TEU and offering low to zero emission through an interchangeable battery electric energy provision system.</p> <p>The activities will include the following SEAMLESS building blocks: 1) vessel navigation and remote fleet operation through a ROCS supporting high-station level of autonomy; interaction with crewed vessels, and smooth passage of locks and bridges; 2) digital port call within the Port of Antwerp-Bruges; 3) autonomous mooring; 4) automated container (un)loading through the gateway infrastructure; 5) utilisation of ModANET to ensure data flows and smooth communication.</p> |
| Enabling Partners | <p>SD - leader of the UC IFMND - design and implementation of the ROC and development of the necessary SW/HW MCDP - validate the autonomous triple joint container handling crane that will utilise the automated stowage plan SW BERGEN - provide producers for the demonstration area (including reporting points, requirements, berthing protocols) ASICO - provide vessels, crew for manning vessel, operators for the ROC, agree on port services</p> | <p>ZULU - leader of the UC, provide vessel DST - provide RIS Port Research Lab for the live coordination and control of the Use Case and lead the scientific analysis from economic/logistics, nautical, and ecological viewpoints POA and PODU - provide port infrastructure MOCS - provide the autonomous mooring system AWAKE.AI - develop and demonstrate the AVSPM Sandbox ILE - provide the necessary logistics operations, legal and regulatory provisions, and RIS technology VNF and IDIT - provide legal and regulatory support and support the RIS development.</p> |
| Resources required | <p>Three vessels for demonstration of ROC: low-attention operations, autonomous mooring equipment, autonomous crane, truck trailers, ROC installation, vessel crew, ROC operators</p> | <p>One vessel (xbarge), auto-mooring equipment, rental of two multi-lift cranes, installation of the Auto-Mooring equipment in Dougres, Antwerp, Nijmegen, and/or Duisburg, crane, automated gantry crane.</p> |
| Transferability Potential | <p>City real estate is very expensive, and ports are typically located in prime locations for residential or leisure developments. Currently, at least three similar cities in Norway are looking into moving the ports out of the city centre either into smaller nearby villages or out to the coast and closer to the main fairways. Ports with similar requirements may also be found in Sweden and Denmark (e.g., Port of London and transport on the Thames, Kristiansand, Oslo, Döbbering, Stockholm), as well as Greece and Turkey in the Mediterranean.</p> | <p>The planning convenience and transport speed of trucks have been modal characteristics that make it difficult for IWT to compete, despite its cost-efficiency and relative reliability. As a result, the Danube basin is predominantly underdeveloped and unexploited, and, thus, hindering the potential capabilities of a continuous freight transport chain that will connect the North Sea with the Black Sea.</p> |

Transferability UCs

Through the transferability cases, further commercially viable scenarios apart from the two demonstrator use cases are to be examined and evaluated at a conceptual level. To achieve this, the consortium includes key partners, that operate in or have a direct link to different regions throughout the EU, including the Eastern Mediterranean, the Western Mediterranean, the Balkan region, as well as the north-western part of continental Europe, all of which can provide the necessary legal/regulatory, traffic, particular of operating vessels, market attributes, etc. and validate the case selection based on real-world market demands. Each transferability case will be coordinated by an Ambassador who is responsible for the activities related to the respective use case (i.e., data collection, meetings, workshops, etc.). All Ambassadors are coordinated by the Alignment Manager (VPI) to establish a common reference framework for the structured evaluation of all demonstrator and transferability use cases.

With respect to the evaluation of these use cases and considering their specificities, different tools, such as cargo flow projections, systems dynamics, process simulation, emission modelling, multi-agent logistics simulation, etc., will be required. Regardless of the respective tool, the evaluation criteria and performance indicators from the structured evaluation framework will be collected for each use case considered and, thus, allow a comparison among SSS use cases and IWT ones, respectively. The insights from the use case evaluation will be incorporated in the development of the sustainability-driven business models.

Apart from the system perspective on evaluation, the individual SEAMLESS key technology building blocks require functional testing on component level. An indicative example of this implementation would be the assessment of individual systems components, such as the Automooringsystem, which will follow the specifications from the structured evaluation framework and be conducted in the respective technical work packages. Similarly, the evaluation of the demonstrator use cases will align with structured evaluation framework.

Figure 11: demo & transferability cases page

3.5 'NEWS & PRESS' PAGE

This section will be regularly updated with news and short press releases that described the project achievements.



Figure 12: News & Press page

3.6 'EVENTS' PAGE

The "Events" page has been conceived as an archive of the most interesting events related to the project scope that the consortium might find interesting to attend.



Figure 13: Events page

3.7 'PUBLIC DOCUMENTS' PAGE

This section works as a repository to all the public documents that will be produced in the frame of the SEAMLESS project, such as

- Public deliverable,
- Publications/Articles,
- Newsletters,
- D&C Materials.



Figure 14: Public documents page

3.8 'RELATED PROJECTS' PAGE

This section of the website will display the information related to EU funded projects similar to SEAMLESS by process or technology or aim, with which the consortium will plan to cooperate for D&C purposes, with the aim of boosting the visibility of the projects that will be reached in the frame of Task 8.4: Liaison with the logistic sector and engagement.



Figure 15: Related projects page

In order to make this page catchier, PNO – in accordance with NTUA, the project coordinator, will rearrange the contents to create a dynamic map of the sectors and projects taken into consideration for this activity.

The update version of this page will be described in deliverable D8.4 D&C Plan updates - Rev 1, to be submitted in M12.

3.9 'CONTACT US' PAGE

The 'Contact Us' page has been structured to allow the website visitors to get in contact with the SEAMLESS coordinator to ask for more information. A simple contact form has been included, and once completed will arrive as an email to the project coordinator.

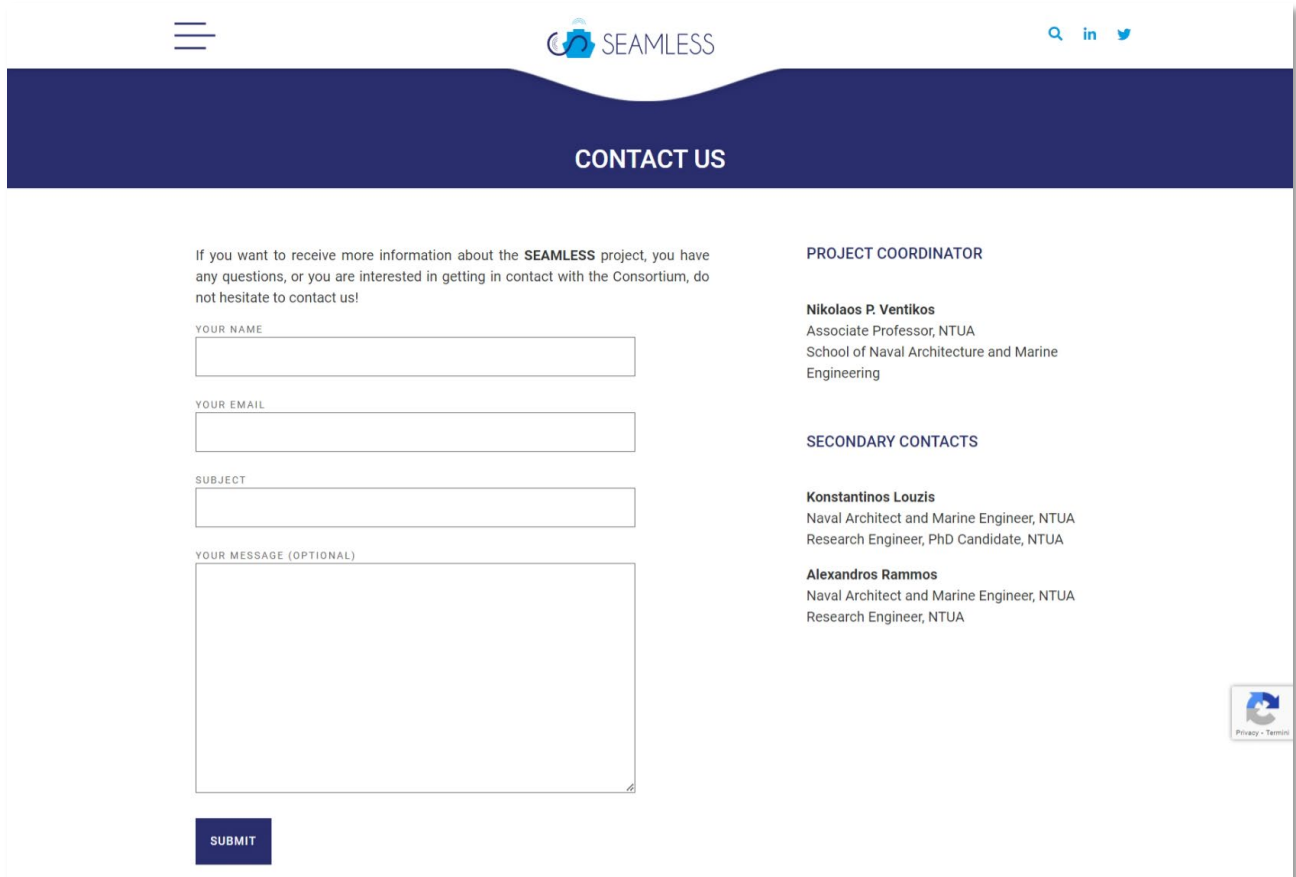


Figure 16: Contact us page

4 CONCLUSIONS

SEAMLESS's website represents a key tool to strengthen the project's image and multiply the dissemination effort's reach to diversified audiences - including relevant industry actors, policymakers, research communities, and general public as well, not only by providing relevant project information and knowledge, but also by assisting as a powerful communication tool, enabling interested readers to know the project's accomplishments, to download all project public deliverables, to discover opportunities to see SEAMLESS's presentations or papers, to learn more about the partners involved and to get in contact with the project's coordinator.