



AutoMated Vessels and Supply Chain Optimisation for Sustainable Short SEa Shipping

D8.4: MOSES Final report on Communication, Dissemination, and scientific activities

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List of Acronyms

Abbreviation / acronym	Description
D1.1	Deliverable number 1 belonging to WP 1
DOI	Digital Object Identifier
EC	European Commission
EU	European Union
H2020	Horizon 2020
KPI	Key Performance Indicators
MS Teams	Microsoft Teams
Mx	Month x
PO	Project Officer
PU	Public
RnD	Research and Development
SSS	Short Sea Shipping
TBU	To be updated (once the information is available)
Tx	Task x
URL	Uniform Resource Locator
WP	Work Package

Executive Summary

Communication, dissemination, and scientific activities are essential to assure the success of a project as ambitious and visionary as MOSES. Funded under the European Union's Horizon2020 Framework Programme, MOSES aimed at significantly enhancing the Short Sea Shipping (SSS) component of the European container supply chain by addressing the vulnerabilities and strains related to the operation of large containerships. In this context, MOSES followed a two-fold strategy for reducing the total time to berth for TEN-T Hub Ports and stimulating the use of SSS feeder services to small ports (hub and spoke traffic) that have limited or no infrastructure.

The scope of this document is to provide a thorough overview of the communication, dissemination and scientific activities performed, organised, and conducted from M19 (January 2022) to M42 (December 2023), end of the project course, from MOSES consortium partners. The overarching objective of dissemination, communication and scientific activities was, and it still is to increase the awareness and the outreach of MOSES results, outputs as well as the technical work carried out within the last two years of the project duration, among all interested target audiences.

Deliverable *D.8.4: MOSES Final report on Communication, Dissemination, and scientific activities*, includes the results of the activities performed in both tasks 8.1 *High impact Communication strategy and activities* and task 8.2 *Scientific dissemination*, as well as information and statistics about MOSES events and conferences, from M19 till the end of the project (M42) and the progress achieved towards the fulfilment of the defined KPI's set in the Communication Plan, as part of D8.1 *MOSES Communication Strategy*. It also provides information on MOSES clustering and networking activities, as well as a description of the activities performed as part of the three MOSES pilot demonstrations and their pilot exploitation workshops and the two MOSES final events.

1. Introduction

1.1 Purpose of the document

The purpose of D8.4 *Final Report on Communication, Dissemination and scientific activities* is to report the communication, dissemination, scientific and activities organised and conducted within the last two years of the project duration (from January 2022 to December 2023). This deliverable has been prepared and delivered by SEAB, as lead beneficiary of the Work Package 8 '*Exploitation, Dissemination, Stakeholder engagement, and Policy Recommendations*', towards recording the contribution from all MOSES project partners.

1.2 Intended readership

MOSES '*Final Report on Communication, Dissemination and scientific activities*' is a public deliverable, which reports all the results of the activities that have been implemented From M19 to M42, as well as information and statistics about MOSES events and Conferences. It is addressed not only to the consortium members, but also to any interested reader (i.e., PU dissemination level).

It is primarily written for the European Commission (EC), Project Officer (PO) and the consortium members of MOSES project, to inform them about MOSES communication, dissemination, and scientific actions. Special effort and focus have been given on making this report as a stand-alone document and comprehensible for the public.

1.3 Document Structure

This document is structured in the following seven sections:

Section 1 introduces the purpose and scope of the document.

Section 2 provides a status description of MOSES communication and dissemination channels and tools.

Section 3 refers to MOSES scientific activities that have been conducted from M19 until M42.

Section 4 summarises MOSES attendance and participation in related events and workshops from M19 till M42, as well as the other activities including the ones that took place as part of MOSES pilot demonstrations and MOSES final events.

Section 5 describes the performed clustering and networking activities from M19 until M42 end of the project.

Section 6 highlights the progress and the status of the communication and dissemination Key Performance Indicators.

Finally, section 7 provides the conclusion of the document.

2. MOSES communication and dissemination channels & tools

2.1 Website

MOSES website is the central hub of the project’s communication activities and is hosted under the following URL: <https://moses-h2020.eu>. The project website introduces MOSES project, providing up-to-date information in a simple way about the project’s objectives and priorities, the proposed technologies, the pilot scenarios, the news and events, the recorded videos, the project results, the related articles, and the developed materials (e.g., public deliverables, open access publications, dissemination material etc.). MOSES webpage is frequently updated, including information about the project advances and developments, as well as the project’s participation and attendance in external events. The material hub remains, also, continuously updated with any corresponding material that derives from the partners’ activities. Further details about MOSES website structure are provided within D8.2 *MOSES Communication Kit*, in the subsection 4.1.

According to MOSES website analytics (Figure 1), the total number of website users has reached approximately 2.3k users within the last two years of the project, while the website views have reached, within the same period, 7.288 views. The new visitors of MOSES website were counted to be 2.313 users. Also, the average session duration is approximately 02.10 minutes and the total number of sessions, within the recorded period, is 3.331.



Figure 1 MOSES website analytics

2.2 Social Networks

MOSES maintains, since its commencement, three social media accounts on Twitter, LinkedIn, and YouTube respectively, to maximize the dissemination of results and effectively increase public engagement. All social media accounts are connected to the project’s website and the visibility of all the accounts is continuously monitored and regularly evaluated using both quantitative measures obtained by its platform’s analytics as well as, qualitative measures towards evaluating any type of comment that may be received. Related content announcements, for all MOSES partners’ activities, as described in the following sub-chapters and chapters have been created and fertilised MOSES social media accounts.

2.2.1 Twitter

MOSES twitter account ([@thesesproject20](https://twitter.com/thesesproject20)) is used for presenting the latest news about the project with regular updates and photo material from MOSES partners’ activities during meetings, workshops, and events, as well as retweets from related twitter accounts of similar initiatives and projects. SEAB oversees the daily management of this tool. Besides, all MOSES partners were also responsible for increasing the awareness of this tool, by creating linkages to their accounts and by providing SEAB with relevant content and contributions related to their achievements.

MOSES twitter account counts 800 followers (up to M42). According to the Twitter analytics (Figures 2 to 4), MOSES Tweets earned an average of 3.9k impressions over the last 91-day period, with approximately 42 impressions per day over this period.

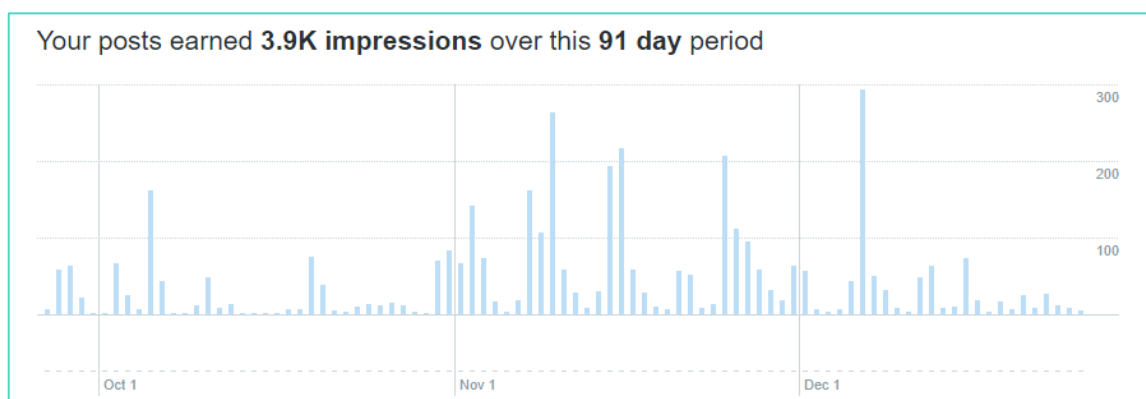


Figure 2 Twitter analytics on the impressions over a 91-day period



Figure 3 Twitter analytics on the impressions per day, over a 91-day period

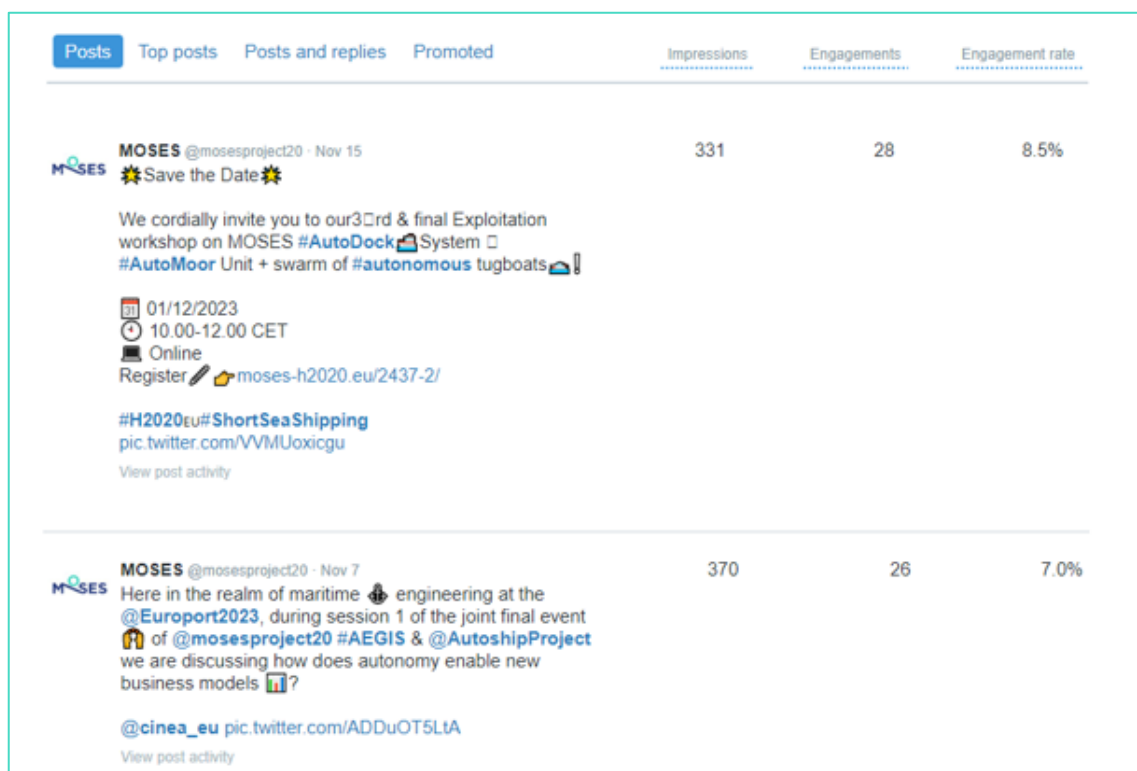


Figure 4 Twitter analytics on the impressions and engagements of two indicative posts

2.2.2 [LinkedIn](#)

MOSES LinkedIn account ([@MOSES_project2020](#)) has been created to share relevant content, connect with already established prominent groups and transmit the project’s insights, concept, vision, and progress. LinkedIn account gathers 803 followers (up to M42).

According to the LinkedIn analytics, senior experts from the fields of engineering, business development, research and education constitute around the 50% of the total visitors over the last 12 months (December 2022-December 2023) (Figure 5). Also, the organic impressions for the LinkedIn posts over the last 12 months (December 2022-December 2023) have reached approximately 30.434 (Figure 6).

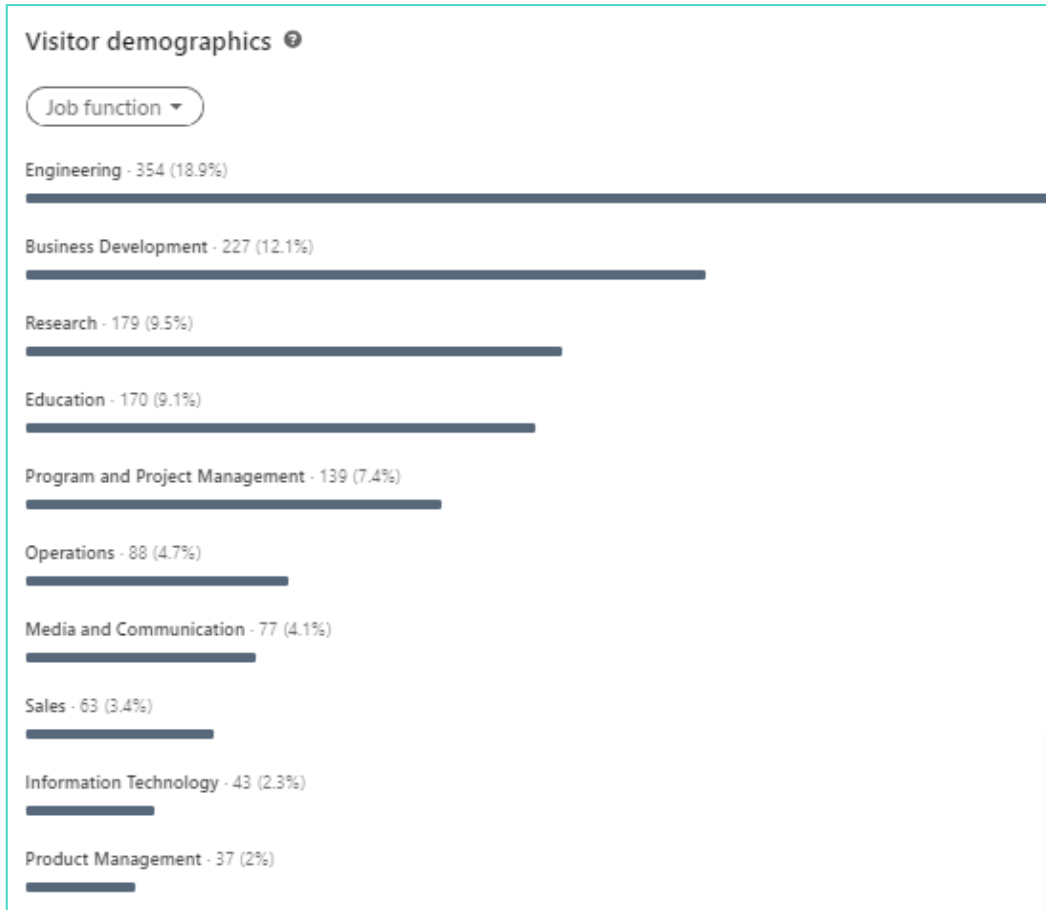


Figure 5 Account visitors over the last 12 months (December 2022-December 2023)

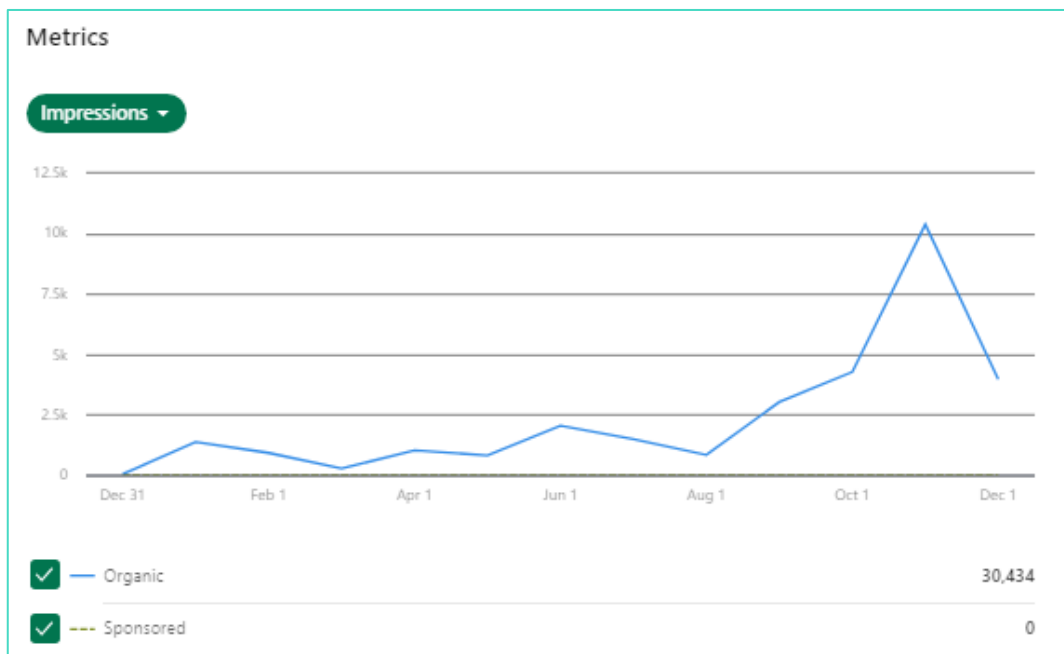


Figure 6 Organic impressions over the last 12 months (December 2022-December 2023)

2.2.3 YouTube

MOSES maintains a YouTube channel which aimed at sharing videos related to the project achievements, in the context of its dissemination and communication activities. YouTube is considered a valuable channel for having stored, just in one place, the project’s audio-visual content, such as the general video, the project’s video campaigns, and pilot demonstrations as well as any other recorded material from the attended events. Up to M42, it has gathered 41 subscribers and 29 videos. Currently, its content has been enriched with four playlists (Figure 7), as follows:

- 1st playlist on MOSES team video series, with 17 videos (one per partner) in total as part of MOSES video communication campaign (available at : https://youtube.com/playlist?list=PLwk_-V8a9dPWJ7O3rrHheK9GrRrY_5rid)
- 2nd playlist on MOSES project videos, with MOSES official project video (available at: https://youtube.com/playlist?list=PLwk_-V8a9dPVCVc_VddwwdsjDyoxxvio1)
- 3rd playlist, with 5 videos deriving from the participation in related events, conferences and webinars (available at: https://youtube.com/playlist?list=PLwk_-V8a9dPWVgxOtBqObZagC86tsws54).
- 4th playlist, with 6 videos from the three MOSES pilot demonstrations (available at: https://www.youtube.com/watch?v=sCOsHHECNrc&list=PLwk_-V8a9dPXK6aPYI_BExVcwrEsG_-RI&pp=iAQB).

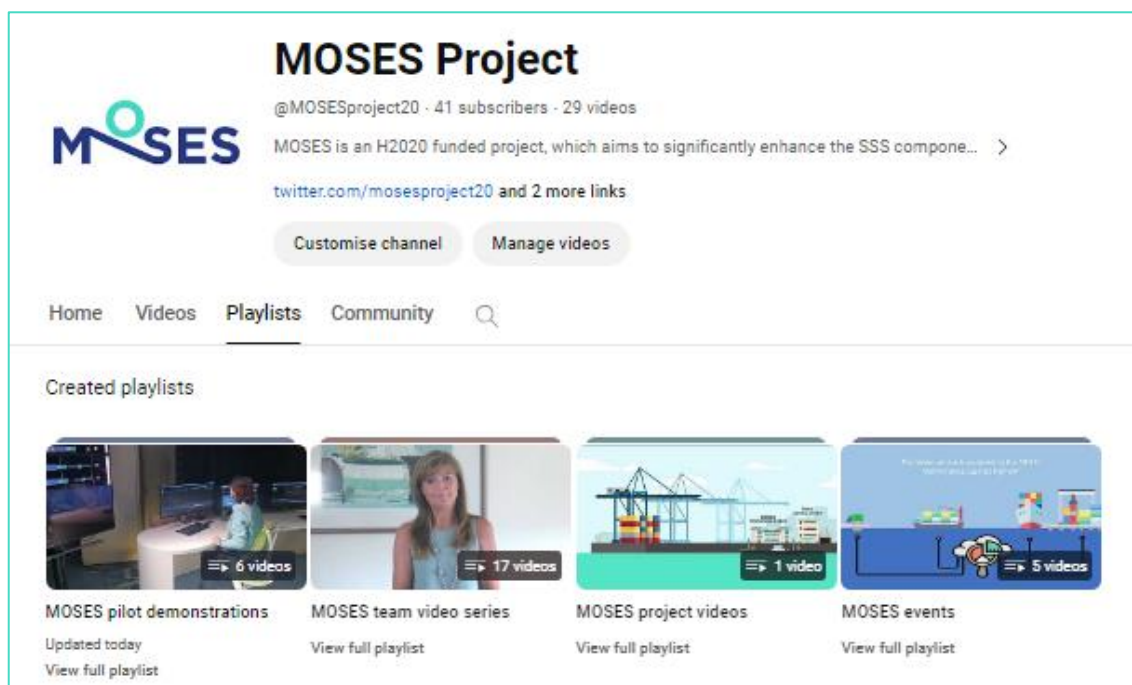


Figure 7 MOSES YouTube playlists

According to the YouTube analytics, the MOSES YouTube channel during the timeframe between January 2022 to December 2023, has reached an average of 2.200 views with 45 hours of watching. The most viewed video is the project’s official one with around 431 views (Figure 8).

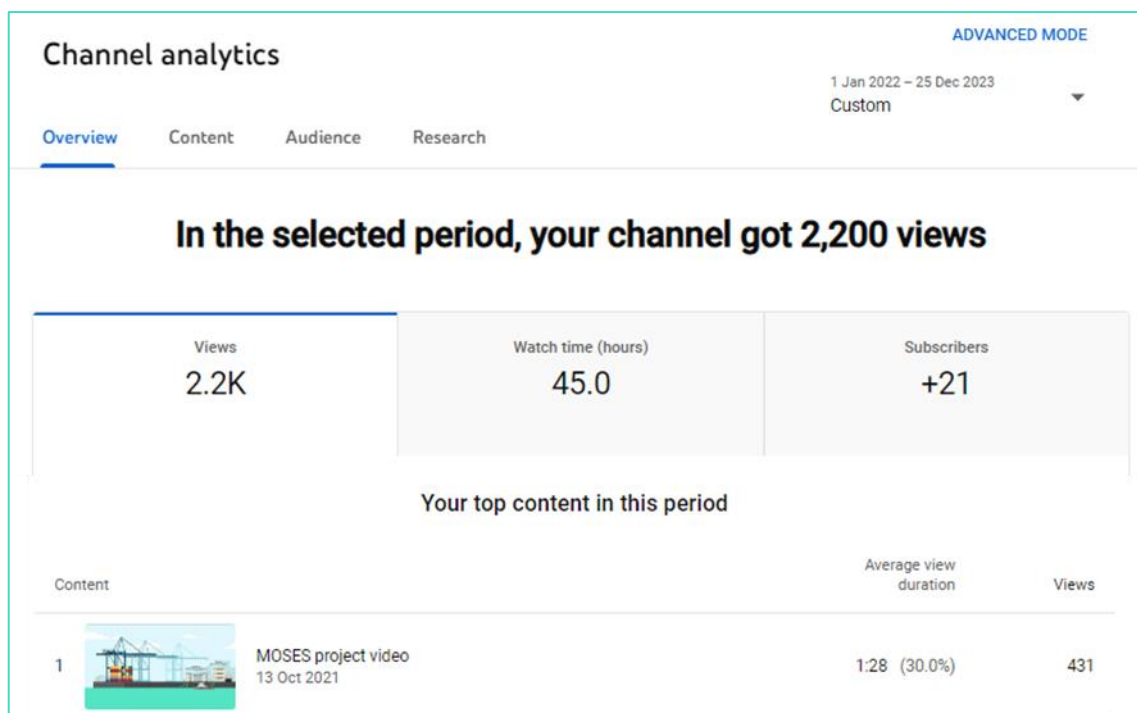


Figure 8 YouTube analytics on views and watching time

2.3 Press releases

Press releases played a significant role in highlighting the successes and advancements made by the project partners. From M19 to M42, the MOSES team has produced an important number of press releases, presented in Table 1. MOSES press activities have been made available on MOSES website, in the material hub, under Media Centre section. Reference to press releases has been also made within D8.2 *MOSES Communication Kit*, in the subsection 3.4 and within D8.3 *MOSES Intermediate report on Communication, Dissemination, and scientific activities*, in subsection 2.3.

Table 1 MOSES press activities

MOSES Press Activities
<p>Article in Pactomundial, <i>Recuperación sostenible (Covid-19 y fondos Europeos de recuperación)</i>, 30/12/2021, ASTANDER clipping 1: https://ntuagr.sharepoint.com/:f:/r/sites/MOSES/Shared%20Documents/WP8/T.8.1%20High%20Impact%20Communication%20Strategy%20and%20activities/Partners%27%20Dissemination-Communication%20activities/2021/Article%20in%20Pactomundial?csf=1&web=1&e=T19Ujp</p>
<p>Article in ALICE website, <i>Automated Vessels and Supply Chain Optimization for Sustainable Short SEa Shipping. MOSES & ALICE at TRA, 14th-17th November, Lisbon, 28/10/2022, SEAB/NTUA</i> clipping 1: https://www.etp-logistics.eu/automated-vessels-and-supply-chain-optimization-for-sustainable-short-sea-shipping-moses-alice-at-tra-14th-17th-november-lisbon/</p>
<p>Article in WATERBORNE website, <i>AUTOMATED VESSELS AND SUPPLY CHAIN OPTIMISATION FOR SUSTAINABLE SHORT SEA SHIPPING</i>, November 2022, SEAB/NTUA clipping 1: https://www.waterborne.eu/projects/digitisation-and-autonomy/moses</p>
<p>Article in https://marasinews.com/, <i>MacGregor brings automation expertise to EU supply chain optimisation projects</i>, 16 October 2023, MacGregor</p>

<p>clipping 1: https://marasinews.com/technology/macgregor-brings-automation-expertise-eu-supply-chain-optimisation-projects</p>
<p>Article in https://www.fbj-online.com/, <i>EU funds automatic vessel loading scheme</i>, 29 September 2023, MacGregor clipping 1: https://www.fbj-online.com/eu-funds-automatic-vessel-loading-scheme/</p>
<p>Press release, <i>Press release of the Municipal Port fund of Mykonos for the final conference of the "Port Security Emergency Coordination" project of the European Territorial Cooperation Program Greece-Cyprus 2014-2020</i>, 23 October 2023, Port of Mykonos clipping 1: https://moses-h2020.eu/wp-content/uploads/2023/10/%CE%94%CE%95%CE%9B%CE%A4%CE%99%CE%9F-%CE%A4%CE%A5%CE%A0%CE%9F%CE%A5-%CE%A3%CE%A5%CE%9D%CE%95%CE%94%CE%A1%CE%99%CE%9F%CE%A5.pdf</p>
<p>Joint final event press release, <i>AEGIS, AUTOSHIP and MOSES Joint final event at the Europort Exhibition in Rotterdam Ahoy</i>, November 2023, All clipping 1: https://moses-h2020.eu/wp-content/uploads/2023/11/AEGIS-AUTOSHIP-MOSES-event_PR.pdf</p>
<p>Δελτίου Τύπου-Δημοτικό Λιμανικό Ταμείο Μυκόνου, <i>MOSES: AutoMated Vessels and Supply Chain Optimisation for Sustainable Short SEa Shipping – Αυτοματοποιημένα πλοία και βελτιστοποίηση αλυσίδας εφοδιασμού για βιώσιμη ναυτιλία μικρών αποστάσεων</i>, 20 November 2023, Port of Mykonos clipping 1: https://moses-h2020.eu/%ce%b4%ce%b5%ce%bb%cf%84%ce%af%ce%bf-%cf%84%cf%8d%cf%80%ce%bf%cf%85-%ce%b4%ce%b7%ce%bc%ce%bf%cf%84%ce%b9%ce%ba%cf%8c-%ce%bb%ce%b9%ce%bc%ce%b5%ce%bd%ce%b9%ce%ba%cf%8c-%cf%84%ce%b1%ce%bc%ce%b5%ce%af/ clipping 2: https://mykonosticker.com/sustainable-short-sea-shipping-automatopoiimena-ploia-kai-veltistopoiisi-alusidjas-e%CF%86odjiasmou-gia-viosimi-nautilia-mikron-apostaseon</p>
<p>Article in MARIN's magazine, <i>Sustainable shortsea shipping gets a step closer through EU MOSES project</i>, December 2023, MARIN clipping 1: https://magazine.marin.nl/marin-report-138/shortsea-shipping</p>

2.4 E-newsletters

MOSES website provided the opportunity to its visitors to sign up and receive a regular newsletter. MOSES e-newsletters constituted an electronic mean of distributing project findings and news, implemented activities as well as upcoming actions. Newsletters were sent to the newsletter subscribers via email, but they were also made available in electronic format in MOSES website (through Material Hub, Newsletter section) and on MOSES social media accounts on Twitter and LinkedIn via related posts. The content of the e-newsletters was based on the continuous progress of the project and aimed at informing the interested audiences and stakeholders about the project's key outcomes and results. Two e-newsletters have already been launched during the last two years of the project course, and they are presented in Table 2.

Table 2 MOSES e-newsletters

MOSES e-newsletters
<p>MOSES 4th e-newsletter, August 2022, https://mailchi.mp/251f03fb9ccf/moses-fourth-newsletter?e=2f48d90d9e</p>

MOSES 5th e-newsletter, August 2023,
<https://mailchi.mp/7266dd44aeaa/moses-fifth-newsletter?e=126af3b29e>

According to the analytics provided by the Mailchimp platform [1], the fourth newsletter was distributed to 64 recipients and the total opens reached 85 clicks (Figure 9).

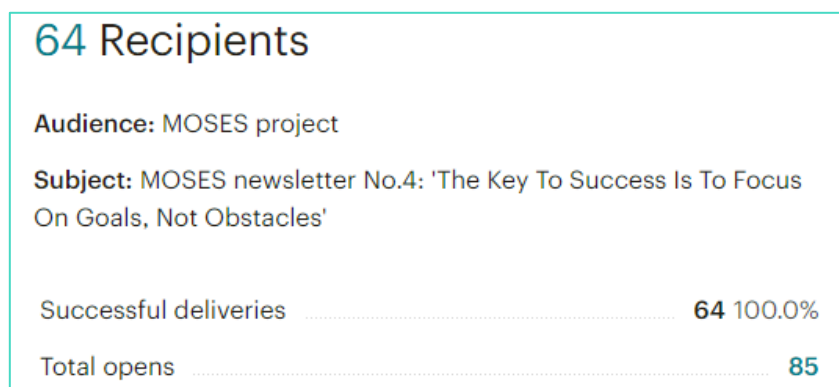


Figure 9 Fourth e-newsletter analytics

The fifth newsletter was distributed to 73 recipients and the total opens reached 72 clicks (figure 10).

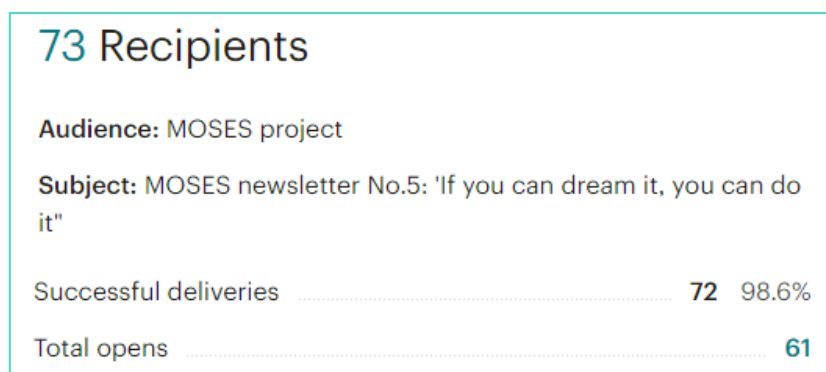


Figure 10 Fifth e-newsletter analytics

2.5 MOSES communication campaign

In the context of strengthening MOSES dissemination and communication strategy, as well as describing MOSES project in a more interactive way and as a complementary action to enrich the project's YouTube channel, a **MOSES video communication campaign** has been designed, prepared, and launched. More specifically, a series of short-video interviews have been released early in September 2021 (M15) with the support of all MOSES consortium members.

Each partner was envisioned to prepare a 2-3 minutes' video introducing their company, their role in MOSES project, as well as sharing their vision about the project. Every produced video became available, apart from the project's YouTube channel, in MOSES website, in the material hub, under the audio-visual section.

With the use of these short videos, MOSESE target audiences gained a more interactive experience with the project. It is notable that, the distribution of short videos is an easy way to be circulated by the partners, followers, some associations with the purpose to, again, increase the publicity of the project.

Up to M18 (December 2021), all partners have prepared and delivered their video material. The first batch with the 9 published ones, is showcased in Figure 11, along with their publication date and the current number of views per video. The rest 8 videos (Figure 12) were made available, in the second batch, within 2022.

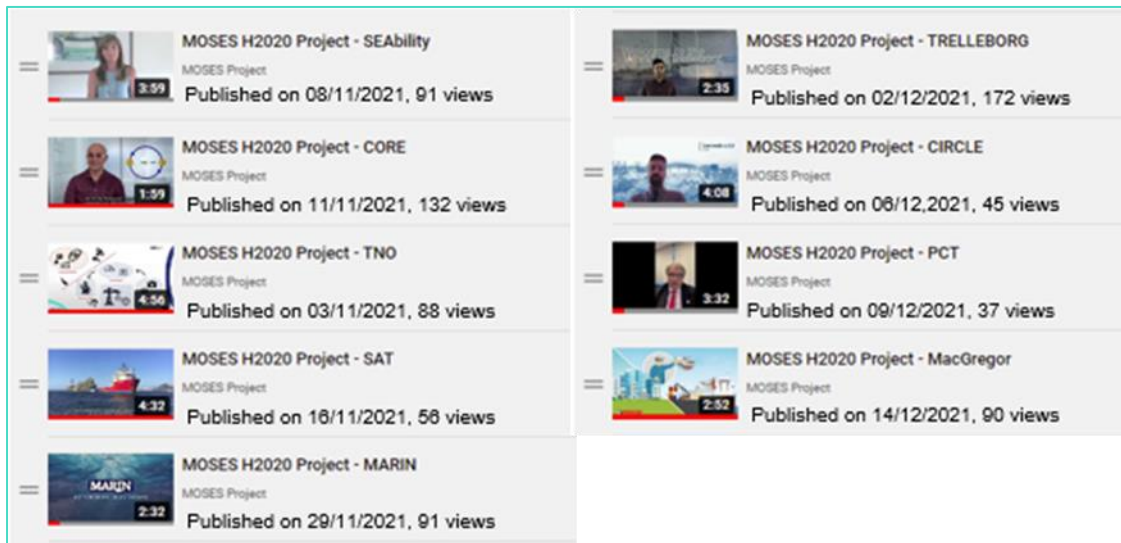


Figure 11 Partners' published videos from MOSES communication campaign

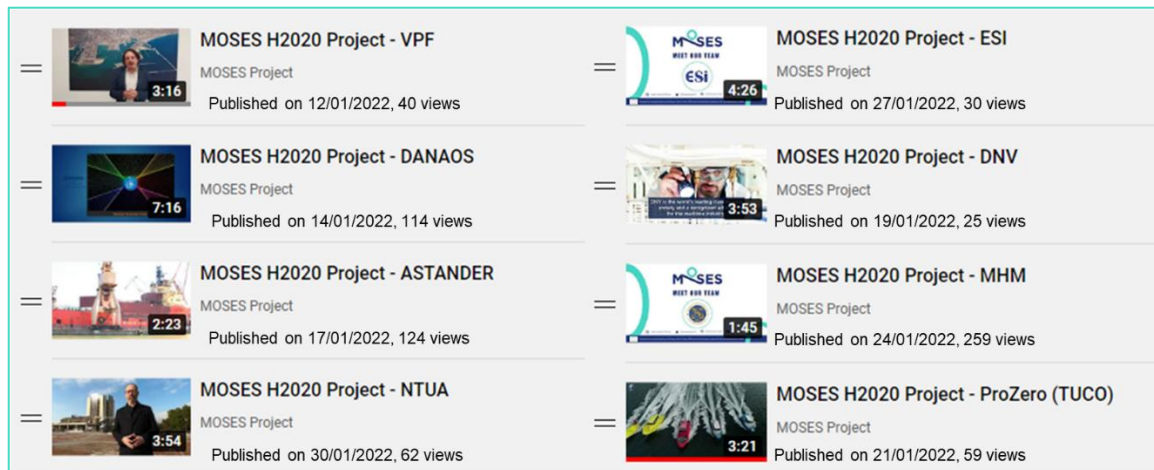


Figure 12 Partners' second batch of published videos from MOSES communication campaign

3. MOSES scientific activities

MOSES team produced scientific material and other contributions for the technical literature, with the aim to share the project progress and research findings with the scientific community. The goal of the scientific material within MOSES, was to advance science by publishing original empirical and theoretical work developed within the project.

Each scientific publication is in accordance and in compliance with the EC rules on Open Access and adhere to the Open Access guidelines set by the H2020 Work Programme [2]. MOSES sustained two open access models for the peer reviewed scientific journal papers: 1) the open access journals (“gold model”) and 2) self-archiving to non-open access journals (“green model”), in order to comply with the Horizon2020 Guidelines on Open Access. In addition, MOSES tried, also, to sustain the Green Model, upon every published scientific and technical article, poster, presentation, and paper, resulting from the project by sharing this material through its active website, in open access mode. MOSES open access philosophy, promoted, at the same time and when appropriate, the Gold Model, to ensure that the produced scientific material is preserved in the long term.

MOSES team has worked since the early beginning of the project, on the production of relevant scientific material based on MOSES achievements seeking to improve visibility of the project on a more solid basis. A detailed description of the scientific activities that have been completed from M19 to M42 of the project is provided in the following paragraphs.

All MOSES scientific activities have been made available through the project’s website, in the material hub, under the scientific material section and through the project’s Zenodo account in the OpenAIRE platform, accessible in the following link: https://explore.openaire.eu/search/project?projectId=corda_h2020::206018c1391211eec14369a1395c983b.

3.1 Publications in conference proceedings

MOSES partners’ publications in conference proceedings are detailly mentioned in Table 3.

Table 3 Publications in conference proceedings

Title	Authors	Event	Publication date/ publisher	DOI/ URL
<i>User-driven development in MOSES: From stakeholder needs to user requirements</i>	Nikolaos Ventikos, Nikolaos Themelis, Christos Pollalis, Konstantinos Louzis, Haris	World of Shipping Portugal, An International Research	27 - 28 January 2022	https://doi.org/10.5281/zenodo.6323085

Title	Authors	Event	Publication date/ publisher	DOI/ URL
	Oikonomidou, Marios-Anestis Koimtzoglou, John Kanellopoulos, Margarita Kostovasilis, Tom Hueting, Hans van den Broek, Mercedes de Juan Muñoyerro, & Nikolaos Monios.	Conference on Maritime Affairs		
<i>Intelligent Operator Support Concepts for Shore Control Centers</i>	H. van den Broek, J. van der Waa	International Maritime and Port Technology and Development Conference (MTEC)-ICMASS	06-07 April 2022	https://zenodo.org/record/6619177#.Yp8TdqhBzct
<i>Applied trajectory generation to dock a feeder vessel</i>	Bas. J. de Kruif	14th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles, 14- 16.09.2022, in DTU Kongens Lyngby, Denmark	14- 16.09.2022, in DTU Kongens Lyngby, Denmark	https://doi.org/10.5281/zenodo.7097032
<i>The MOSES project: enhancing short sea shipping with automated technologies</i>	Mrs. Mercedes De Juan Muñoyerro, Mr. Ignacio Benitez, Mr. Jorge Marcos	28th International Conference on Urban and Maritime Transport and the Environment, 19-21.09.2022	19- 21.09.2022, Online	https://doi.org/10.5281/zenodo.7106929
<i>Dynamic Task Allocation Algorithms within Intelligent Operator Support Concepts for Shore Control Centres</i>	Tycho Brug, Jasper van der Waa, Valentina Maccatrozzo, Hans van den Broek	21st Conference on Computer Applications and Information Technology in the Maritime Industries COMPIT'22 Pontignano /	Pontignano / Italy, 21-23 June 2022	https://doi.org/10.5281/zenodo.7189228

Title	Authors	Event	Publication date/ publisher	DOI/ URL
		Italy, 21-23 June 2022		
<i>El proyecto MOSES: Mejora del transporte marítimo de corta distancia con tecnologías automatizadas</i>	Mercedes de Juan, Jorge Marcos, Vicente Perales, Miguel Llop, Juan Luis Sanchez Echevarría, Laura Herrera Hoyos, Maria Sampedro	61º Congreso de Ingeniería Naval e Industria Maritima 26-28 Octubre de 2022, Palma de Mallorca	26-28 octubre de 2022, Palma de Mallorca	https://doi.org/10.5281/zenodo.7319728
<i>Paving the way for the future of Short Sea Shipping: The MOSES project</i>	Margarita Kostovasili, John Kanellopoulos, Nikolaos Ventikos, Konstantinos Louzis, Haris Oikonomidou, Christos Pollalis	Transport Research Arena (TRA) Conference 2022	14-17 November 2022, at the Lisbon Congress Center (CLL)	https://doi.org/10.5281/zenodo.7377058
<i>Preliminary Hazard Analysis for an Innovative Container Feeder Concept</i>	N. P. Ventikos, N. Themelis, K. Louzis, C. Georgopoulou, G. Hagesteijn, A. Grasman, E. Rotteveel	Hellenic Institute of Marine Technology	ANNUAL CONFERENCE 2022 HELLENIC INSTITUTE OF MARINE TECHNOLOGY Eugenides Foundation, 22-23 November 2022	https://doi.org/10.5281/zenodo.7441221
<i>Autonomous docking of a feeder vessel</i>	B.J. de Kruif	International Ship Control Systems Symposium 2022 (ISCSS)	08-10/11/2022, Netherlands	https://doi.org/10.5281/zenodo.7436049
<i>Simulation of a feeder on a port-to-port mission</i>	Ed van Daalen, Giorgio Iavicoli, Hans Cozijn, Bas de Kruif	OCEANS23	05-08.06.2023, Limerick	https://zenodo.org/record/8046490
<i>Control of a full port-to-port mission for a feeder vessel</i>	Bas J. de Kruif, Ed F. G. van Daalen, H. Cozijn, G. Iavicoli	OCEANS23	05-08.06.2023, Limerick	https://zenodo.org/record/8046528
<i>Automating vessels berthing, docking and stevedorage</i>	Giannis Kanellopoulos, Margarita	IPIC 2023	13-15.06.2023,	https://doi.org/10.5281/zenodo.7319728

Title	Authors	Event	Publication date/publisher	DOI/URL
<i>operations: The MOSES project</i>	Kostovasilis, Angelos Amditis, Nikolaos Ventikos, Konstantinos Louzis, Eleni S. Krikigianni, Evangelia Latsa		Athens, Greece	odo.8059101
<i>MOSES Shore Tugboat Control Station: Development of a shore-side system to support autonomous tugboat operation</i>	N.P. Ventikos, N. Themelis, K. Louzis, M. Koimtzoglou, M. de Juan, V. Perales	17th Annual Conference of Marine Technology	14-15.11.2023, Athens, Greece	https://doi.org/10.5281/zenodo.10171314
<i>Autonomously docking a feeder vessel; an experimental validation</i>	Bas. J. de Kruif	CAMS 2024	September 3-5, 2024, Blacksburg, Virginia, USA	TBU
<i>Round-Trip Between Two Ports - Autonomous Operation of a Container Feeder Vessel</i>	J.L. Cozijn, B.J. de Kruif, E.F.G. van Daalen, G. Iavicoli	OMAE 2024 conference	OMAE Conference, Singapore, June 2024	TBU

3.2 Publications in renowned scientific journals

MOSES partners' publications in renowned scientific journals are thoroughly mentioned in the following Table 4.

Table 4 Publications in scientific journals

Title	Authors	Event	Publication date/publisher	DOI/URL
<i>Matchmaking the Emerging Demand and Supply Need in the Maritime Supply Chain Domain: A System Design Framework</i>	Eleni S. Krikigianni, Evangelia Latsa, Sotiris P. Gayialis, Nikolaos A. Panayiotou, Margarita Kostovasilis, Ioannis Kanellopoulos and Angelos Amditis	Sustainability Journal 2022, Special Issue Strategic Approaches to Sustainability in Green Operations and Supply Chain Management	Sustainability 2022, 14(21), 14622; Received: 5 September 2022 / Revised: 27 October 2022 / Accepted: 3 November 2022 / Published: 7	https://doi.org/10.3390/su14211462

Title	Authors	Event	Publication date/ publisher	DOI/ URL
			November 2022	
<i>Autonomous docking of a feeder vessel</i>	B.J. de Kruif	Journal of Marine Engineering & Technology	Received 04 Apr 2023, Accepted 04 Nov 2023, Published online: 14 Nov 2023	https://doi.org/10.1080/20464177.2023.2281742
<i>Using a Digital Twin as Substitute for Surveillance Cameras in Remote Supervisory Control</i>	T.F. Hueting, F.B. ter Haar, B.T. van Manen, J. van den Broek	Journal Cognition, Technology and Work	TBU	TBU
<i>Towards the development of an operational fail-safe approach for the MOSES autonomous tugboats</i>	TBU	Journal of Marine Engineering & Technology, Special Issue on Advances on Maritime Autonomous Surface Ships	TBU	TBU
<i>The MOSES Autonomous Tugboat swarm: Development of a virtual training environment for machine learning</i>	TBU	Journal of Marine Engineering & Technology, Special Issue on Advances on Maritime Autonomous Surface Ships	TBU	TBU
<i>A simulation-based approach to assess the ship energy performance during the early stage design of an innovative feeder vessel</i>	Gerco Hagesteijn, Alex Grasman, Konstantinos Louzis, Nikolaos P. Ventikos, Erik Rotteveel	Journal of Marine Science and Engineering, Special Issue "Advances in Innovative Solutions for Ship Energy Efficiency"	TBU	TBU

3.3 University Thesis

A Master Thesis entitled “*Stereo Pointclouds for Safety Monitoring of Port Environments*” has been conducted, as part of MOSES project, by Mrs. Middelhoek, Femke within the Programme of Mechanical Engineering, Vehicle Engineering, Cognitive Robotics at Delft University of Technology.

The MOSES project develops an autonomous vessel equipped with an autonomous crane to optimise the supply chain of shortsea shipping. This study focusses on monitoring the safety of the port environment based on stereo camera data generated by sensors attached to the crane at 15m altitude, oriented 45° downward. The objective is to detect individuals and estimate their motion. Semi Global Block Matching is implemented for stereo pointcloud generation (a pointcloud based on the disparity image and stereo camera calibration information). Voxel averaged stereo pointcloud downsampling is performed for improved data compliance with CenterPoint. Background subtraction is implemented with Gaussian Mixture Models (GMMs). The study proposes a novel implementation to fit a GMM on per-point 3D spatial (xyz) and color information for enhanced background-foreground segmentation of the stereo pointclouds. 3D object detection and velocity prediction are based on CenterPoint, customised to take color features into account. The result is a robust detection pipeline with a top performance of 81.5% mAP, 4% Average Orientation Error and 9.4% Average Velocity Error on a simulated dense port environment dataset. Background subtraction is implemented to improve cross-environment generalisation, an important feature for MOSES considering the mobile nature of the vessel and the likelihood that it would attend unseen environments. Voxelaveraged down sampling of the stereo pointcloud advances this by creating a uniform data structure, further facilitating the transfer of learnt features to previously unobserved scenes. Including color information of the current frame reduces the impact of spatial uncertainty of the stereo pointcloud. It improves detection performance, particularly when excluding the color information of the temporal reference frames included for velocity prediction. The transferability of the pipeline developed in simulation to reality is demonstrated on a basic real-world scenario.

The file is accessible using the following link: <https://repository.tudelft.nl/islandora/object/uuid%3Acdd1cfe6-6b6d-4fca-9f54-a64f37111b32?collection=education> and is also available in MOSES website under Material Hub> Scientific material section and in MOSES news section here: <https://moses-h2020.eu/master-thesis-stereo-pointclouds-for-safety-monitoring-of-port-environments-20-09-2023/>.

4. MOSES participation & attendance

During the second half of the project, from M19 to M42, all MOSES partners have been actively engaged and contributed to the communication of MOSES’s vision and concept, as well as in the dissemination of its findings and outcomes at several conferences, workshops, seminars and webinars via presentations, constructive discussions, and posters, towards facilitating, also, the connection with the stakeholder’s community.

Most of these events constituted a great opportunity for communicating MOSES’s concept and objectives, disseminating its findings and achieving a higher outreach of the project. For this aim, an important number of participants from several fields related to the maritime and shipping sector (professionals, academics & students, technical experts, industrial experts, general public, media, investors, customers, other) were actively involved.

4.1 Conference events

Table 5 highlights and presents the events that MOSES partners attended during the second half of the project period and includes information about the event, the date, the location, the presentation material, the partners involved and the corresponding announcement link, accompanied by the presentation material, on MOSES website.

Table 5 MOSES Conference events

Date	Event	Location	Presentation	Partners	Link to MOSES website
27/01/2022	Belgian shipowners’ association, Introduction mass-think tank	Antwerp, Belgium	Autonomous tugboats for efficient, eco-friendly and safe port operations	CORE	https://moses-h2020.eu/belgian-shipowners-association-introduction-mass-think-tank-27-01-2022/
27-28/01/2022	World of Shipping Portugal, An International Research Conference on Maritime Affairs	Online	User-driven development in MOSES: From stakeholder needs to user requirements	NTUA, TNO, VPF, CORE	https://moses-h2020.eu/world-of-shipping-portugal-conference-2022/
			Discussing the MOSES project: Automated technologies for green and efficient short sea shipping	NTUA	
08/03/2022	MMI Platform	Online	Remote supervisory control for a robotic	TNO	https://moses-h2020.eu/mmi-platform/

Date	Event	Location	Presentation	Partners	Link to MOSES website
			container handling system		
05/04/2022	5th International Logistics Forum & Supply Chain Day	Athens, Greece	eFTI Regulation and its effects on the Greek Market	NTUA	https://moses-h2020.eu/5th-international-logistics-forum-supply-chain-day/
04-07/04/2020	Nor-Shipping 2022	Oslo, Norway	MOSES video	NTUA	https://moses-h2020.eu/nor-shipping-2022/
6-7/04/2022	International Maritime and Port Technology and Development Conference (MTEC)-ICMASS	Both onsite in Singapore and virtual format	Intelligent Operator Support for Shore Control Centers	TNO	https://moses-h2020.eu/international-maritime-and-port-technology-and-development-conference-mtec/
21-23/06/2022	21th Conference on Computer Applications and Information Technology in the Maritime Industries COMPIT'22	Pontignano, Italy	Dynamic Task Allocation Algorithms within Intelligent Operator Support Concepts for Shore Control Centres	TNO	https://moses-h2020.eu/21th-conference-on-computer-applications-and-information-technology-in-the-maritime-industries-compit22-21-23-06-2022/
30-01/06/2022	14th ITS European Congress	Toulouse, France	Federated Logistics Platforms –The Greek Ecosystem	NTUA	https://moses-h2020.eu/14th-its-european-congress/
04-07/09/2022	International Symposium on Reliability Engineering and Risk Management (ISRERM)	Hannover, Germany	MOSES Autonomous tugboat swarm operation: Operational scenarios, requirements, and architecture	NTUA	https://moses-h2020.eu/international-symposium-on-reliability-engineering-and-risk-management-isrerm-2022-04-07-09-2022/
14-16/09/2022	14th IFAC Conference on Control Applications	DTU Kongens Lyngby, Denmark	Trajectory generation to dock a feeder vessel	MARIN	https://moses-h2020.eu/14th-ifac-conference-on-control-applications-in-marine-systems-robotics-and-

Date	Event	Location	Presentation	Partners	Link to MOSES website
	in Marine Systems				vehicles-14-16-09-2022/
19-21/09/2022	28th International Conference on Urban and Maritime Transport and the Environment	Online	The MOSES project: enhancing short sea shipping with automated technologies	VPF	https://moses-h2020.eu/28th-international-conference-on-urban-and-maritime-transport-and-the-environment-19-21-09-2022/
26-28/10/2022	61º Congreso de Ingeniería Naval e Industria Maritima	Palma de Mallorca, Spain	MOSES: Mejora del transporte marítimo de corta distancia con tecnologías automatizadas	VPF, AST	https://moses-h2020.eu/61o-congreso-de-ingenieria-naval-e-industria-maritima-26-28-10-2022/
08-10/11/2022	International Ship Control Systems Symposium 2022 (iSCSS)	TU Delft, The Netherlands	Autonomous docking of a feeder vessel	MARIN	https://moses-h2020.eu/international-ship-control-systems-symposium-2022-iscss-08-10-11-2022/
14-17/11/2022	Transport Research Arena (TRA) Conference 2022	Lisbon Congress Center (CLL)	The necessity of digital as well as physical automation for sustainable modal shifts Paving the way for the future of Short Sea Shipping: The MOSES project	NTUA	https://moses-h2020.eu/transport-research-arena-tra-2022-14-17-11-2022/
22-23/11/2022	ANNUAL CONFERENCE 2022 HELLENIC INSTITUTE OF MARINE TECHNOLOGY	Athens, Greece	Preliminary Hazard Analysis for an Innovative Container Feeder Concept	NTUA	https://moses-h2020.eu/annual-conference-2022-hellenic-institute-of-marine-technology-22-23-11-2022/
29/11/2022	EMSA Workshop on Maritime Autonomous Surface Ships (MASS)	Online	MOSES project Technical implementation	NTUA	https://moses-h2020.eu/emsa-workshop-on-maritime-autonomous-surface-ships-mass-29-11-2022/
06/12/2022	SMASH! - Netherlands Forum Smart Shipping	Schiezaal van Rotterdam Mainport	Skills en shore control centers, design choices and human	TNO	https://moses-h2020.eu/smash-netherlands-forum-for-

Date	Event	Location	Presentation	Partners	Link to MOSES website
		Institute/STC in Rotterdam, The Netherlands	factors challenges		smart-shipping-06-12-2022/
20-24/03/2023	Inland Navigation Week 2023,	Hybrid, Brussels, Belgium	The MOSES Project: Automated and autonomous technologies for modal shift to Short Sea Shipping	NTUA	https://moses-h2020.eu/inland-navigation-week-2023-21-03-2023/
22-24.05.2023	15th ITS European Congress	Lisbon, Portugal	Robotic cargo handling for autonomous ships to enable transshipment in ports with limited or no infrastructure	NTUA	https://moses-h2020.eu/15th-its-european-congress-22-24-05-2023/
05-08.06.2023	OCEANS23	Limerick, Ireland	Simulation of a feeder on a port-to-port mission Control of a full port-to-port mission for a feeder vessel	MARIN	https://moses-h2020.eu/oceans-2023-05-08-06-2023/
13-15.06.2023	IPIC2023	Athens, Greece	Automating vessels berthing, docking and stevedorage operations: The MOSES project	SEAB, NTUA	https://moses-h2020.eu/ipic2023-13-15-06-2023/
19-23.06.2023	LMDE: LEADING AND MANAGING IN THE DIGITAL ERA: Shaping the Future of Work and Business Education	Syros Island, Cyclades, Greece	The MOSES Innovative Feeder Vessel: Creating alternative pathways for transporting containerized cargo to the Greek islands	NTUA	https://moses-h2020.eu/lmde-international-conference-shaping-the-future-of-work-and-business-education19-23-06-2023/
22.06.2023	DNV Research and	Athens, Greece	Autonomy and Electrification in	NTUA	https://moses-h2020.eu/dnv-research-and-

Date	Event	Location	Presentation	Partners	Link to MOSES website
	Development Forum		Shipping:The MOSES project		development-forum-22-06-2023/
12.07.2023	Maritime Informatics & Robotics - Maritime2023	Syros Island, Cyclades, Greece	autoMated vessels and supply chain Optimisation for sustainable short SEa Shipping	NTUA	https://moses-h2020.eu/technical-chamber-of-syros-12-07-2023/
07.11.2023	MOSES joint final event with AEGIS & AUTOSHIP at EUROPORT 2023	Rotterdam, The Netherlands	Load Handling and autonomy	SEAB, NTUA, TNO, MACGREGOR, MARIN, MHM, TREL, VPF	https://moses-h2020.eu/moses-joint-final-event-with-aegis-autoship-07-11-2023-2/
			Remote support of container handling systems		
			How safe do we need to be?		
			New opportunities for ports with automated terminals and ships – Transferability cases		
15.11.2023	17th Annual Conference of Marine Technology	Athens, Greece	MOSES Shore Tugboat Control Station: Development of a shore-side system to support autonomous tugboat operation	NTUA	https://moses-h2020.eu/17th-annual-conference-of-marine-technology-14-15-11-2023/
27-30.11.2023	ICMAR NAV 2023 International Conference on Maritime Autonomy and Remote Navigation	Australian Maritime College, Launceston, Tasmania	MOSES Project Overview	TRELL	https://moses-h2020.eu/icmar-nav-2023-27-30-11-2023/

4.2 Workshops, Seminars, Webinars

Table 6 presents the workshops, seminars and webinars, that MOSES partners either participated and/ or attended from M19 to M42, including information about the type of dissemination activity and the corresponding announcement link, accompanied by the presentation material, on MOSES website.

Table 6 MOSES Workshops/Seminars/Webinars

Workshops/Seminars/Webinars	Type of dissemination activity	Link
NOVIMOVE Joint EU Smart Shipping & Logistics Platform, 06/04/2022, NTUA	Workshop presentation on MOSES concept and innovations: Indicators of success and ambition	https://moses-h2020.eu/novimove-joint-eu-smart-shipping-logistics-platform/
Erasmus+ Port and Skills seminar, 02/06/2022, TNO	Seminar presentation on Intelligent Operator Support for Shore Control Centers	https://moses-h2020.eu/port-and-skills-erasmusseminar/
Logistop webinar, 15/06/2022, VPF	AutoMated Vessels and Supply Chain Optimisation for Sustainable Short Sea Shipping	https://moses-h2020.eu/logistop/
SMM joint seminar on autonomy in ships and ports, 07/09/2022, VPF	Seminar presentation on Adaptation of port call process for autonomous ship in a big port	https://moses-h2020.eu/smm-joint-seminar-on-autonomy-in-ships-and-ports-07-09-2022/
Marine Technology Workshop, 12/09/2022, NTUA	Workshop presentation on AutoMated Vessels and Supply Chain Optimisation for Sustainable Short Sea Shipping	https://moses-h2020.eu/marine-technology-workshop-12-09-2022/
MARIN R&D seminar 2022, 02/11/2022, MARIN	Seminar presentation on Intelligence for automated manoeuvres; docking of a feeder vessel	https://moses-h2020.eu/marin-rd-seminar-2022-02-11-2022/
Autonomous Ship Reality, (part of a webinar series), 08-10/03/2023, NTUA, DANAOS	Webinar presentations on Will the seas of the future be dominated by autonomous ships? And on Reaching autonomous control in vessel operation	https://moses-h2020.eu/autonomous-ship-reality-08-10-03-2023/

	(Conditional Automation Level 3)	
MARIN R&D seminar 2023, 16/05/2023, MARIN	Seminar presentation on Autonomous sailing from port to port	https://moses-h2020.eu/marin-rd-seminar-2023-16-05-2023/

4.3 Exhibitions/Booths

The following Table 7 presents the exhibitions and booths, that MOSES partners either organized or attended from M19 till M42, including information about the date the type of dissemination activity and the corresponding announcement link, accompanied by the presentation material, on MOSES website.

Table 7 MOSES Exhibitions/Booths

Exhibitions/Booths	Type of dissemination activity	Link
Aland Maritime Day, 10/05/2022, TRELL	Exhibition discussion on AutoMoor as a key component of the MOSES Project, with a conference delegate at Aland Maritime Day, Mariehamn, Finland on May 10.	https://moses-h2020.eu/alandia-maritime-day/
Posidonia 2022, 06-10/06/2022, TRELL/DANAOS	Exhibition & Booth per partner with MOSES printed dissemination material	https://moses-h2020.eu/posidonia-2022/
Connecting Europe Days, 28-30/06/2022, NTUA	MOSES booth	https://moses-h2020.eu/connecting-europe-days-28-30-06-2022/
Transport Research Arena 2022, 14-17/11/2022, NTUA	MOSES at ALICE booth MOSES at EC booth MOSES at WATERBORNE booth	https://moses-h2020.eu/transport-research-arena-tra-2022-14-17-11-2022/
8th ITS Hellas Conference. 07-08/12/2022, SEAB	SEAB showcased MOSES project in its booth	https://moses-h2020.eu/8th-its-hellas-conference-07-08-12-2022/
15th ITS European Congress, 22-24.05.2023, NTUA	MOSES at NTUA's booth	https://moses-h2020.eu/15th-its-european-congress-22-24-05-2023/
IPIC2023, 13-15/06/2023, NTUA, SEAB	MOSES at NTUA's booth	https://moses-h2020.eu/ipic2023-13-15-06-2023/
EUROPORT 2023, 07-10/11/2023, MARIN	MOSES at MARIN's booth	https://moses-h2020.eu/europort-2023-07-10-11-2023/

4.4 MOSES pilot demonstrations & their exploitation workshops

As an integral component of the MOSES project, three pilot demonstrations were meticulously organized, each accompanied by a dedicated exploitation workshop. These events served as pivotal milestones within the project's progress and development, showcasing the practical implementation and efficacy of the MOSES concept and innovations. The demonstrations provided a real-world context for stakeholders to witness the capabilities of the majority of MOSES innovations in action, fostering a deeper understanding of their functionalities and their innovation and market potential. Simultaneously, the exploitation workshops facilitated comprehensive discussions, enabling participants to explore potential gaps, address challenges, identify further opportunities and strategize for the effective integration of MOSES innovations within diverse contexts. These pilot demonstrations and accompanying workshops played a crucial role in refining and advancing the MOSES project, ultimately contributing to its successful evolution and broader adoption.

4.4.1 MOSES pilot 1

The Pilot 1 Demonstration

On October 16 – 20, 2023, in Faaborg port, Denmark, MOSES team successfully conducted the MOSES Pilot 1 Demonstration: AutoDock (Figure 13).



Figure 13 Pilot 1 demonstration flyer

Initially, the level of automation of the workboat (acting as a tugboat) was assessed within the harbor environment using all its integrated sensors through its Auto Pilot. In parallel the functionalities and the level of automation of the AutoMoor Unit were examined and tested. Consequently, communication between all actors was established and tested, which was followed by the main demonstration.

During the demonstration, TREL showcased the ability of the AutoMoor unit to autonomously moor a barge (acting as a containership). This barge, with a built-in structure manufactured by AST (mimicking a vessel's wall) was maneuvered from a

predefined point by two TUCO workboats, one of them being fully autonomous. Both workboats were acting as a swarm, constantly exchanging data between them and the AutoMoor unit (when a specific mooring distance was achieved). The autonomous tugboat was retrofitted with various sensors by NTUA and ESI, which were feeding the workboat's AutoPilot developed by CORE. The ability of a STCS mock-up to monitor the process was also tested in real time by VPF.

The event agenda as well as MOSES Pilot 1 demo video and photo material are available in the following link: <https://moses-h2020.eu/moses-pilot-1-demonstration-autodock-16-20-10-2023/>.

The Pilot 1 Exploitation Workshop

The Exploitation workshop on MOSES AutoDock System (Figure 14) took place virtually on December 1, 2023, at 10.00-12.00 CET, via Zoom platform.



Figure 14 Pilot 1 Exploitation Workshop dissemination banner

The Exploitation workshop on AutoDock System aimed to present the corresponding pilot demonstration outcomes and gather stakeholders' viewpoints on how MOSES can sustain a roadmap for post-project exploitation.

The event agenda as well as MOSES Pilot 1 demo video and presentation and photo material are available in the following link: <https://moses-h2020.eu/2437-2/>.

4.4.2 [MOSES pilot 2](#)

The Pilot 2 Demonstration

On 14 of September 2023, at Wageningen, in the Netherlands, MOSES team successfully conducted the MOSES Pilot 2 Demonstration: Autonomous Sailing of an Innovative Container Feeder Vessel (Figure 15), making a Roundtrip Between Two Ports.



Figure 15 Pilot 2 demonstration flyer

The autonomous operation of the vessel was first investigated using time-domain computer simulations. Using a 1:17 scale model of the ship, MOSES team members demonstrated the autonomous operation of the innovative container feeder vessel in MARIN’s Seakeeping and Manoeuvring Basin (SMB). During this demonstration, the vessel made a round-trip between two ports, including autonomous docking and undocking.

The innovative vessel was designed by MARIN & NTUA. The autonomous operation was carefully investigated and prepared through computer simulations. The onboard dummy of the robotic container handling system was developed by TNO and MacGregor.

The demonstration day was initiated by a number of fruitful and explanatory presentations and was concluded with the realization of the pilot demonstration. Safety Instructions and House Rules were given to all participants prior to the Walk to Seakeeping and Maneuvering Basin.

The MOSES Pilot 2 demonstration was, also, attended by two of the MOSES Advisory Board members, Mr. George Karavolos (from SEAMARK Marine) & Mr. Frank Relou (from Sea Machines Robotics).

The event agenda as well as MOSES Pilot 2 demo video and related presentation and photo material are available in the following link: <https://moses-h2020.eu/moses-pilot-2-demonstration-autonomous-sailing-of-an-innovative-container-feeder-vessel-making-a-roundtrip-between-two-ports-14-09-2023/>.

The Pilot 2 Exploitation Workshop

The Exploitation workshop on the autonomous sailing of MOSES Innovative Container Feeder Vessel, took place virtually on November 2023, at 10.00-12.00 CET, via Zoom platform (Figure 16).



Figure 16 Pilot 2 Exploitation Workshop dissemination banner

The Exploitation workshop on the autonomous sailing of MOSES Innovative Container Feeder Vessel aimed to present the corresponding pilot demonstration outcomes and gather stakeholders' viewpoints on how MOSES can sustain a roadmap for post-project exploitation.

The event agenda as well as MOSES Pilot 2 demo video and presentation and photo material are available in the following link: <https://moses-h2020.eu/exploitation-workshop-on-the-autonomous-sailing-of-moses-innovative-container-feeder-vessel/>.

4.4.3 MOSES pilot 3

The Pilot 3 Demonstration

On 28 of September 2023, in Soesterberg, the Netherlands & in Örnsköldsvik, Sweden, MOSES team successfully conducted the MOSES Pilot 3 Demonstration: Robotic Container Handling System (Figure 17).



Figure 17 Pilot 3 demonstration flyer

This demonstration was related to the ability of a spreader to lock on to a container on the quayside before transferring it to the vessel without an onsite crane operator and it, also, verified the system's response, when a person enters the safety zone. The remote coordination was made through the shore control center, to ensure operations can be resumed safely and without delay following automatic shut-down.

As part of the demonstration, MacGregor showcased the ability of the spreader to lock on to a container on the quayside before transferring it to the vessel without an onsite crane operator. To test the system's limitations, MacGregor defined scenarios in which the containers were placed incorrectly. The demonstration, also, verified the system's response, when a person enters the safety zone and its coordination with the shore control center, coordinated by TNO, to ensure operations can be resumed safely and without delay following automatic shut-down.

The demonstration day was initiated by a number of fruitful and explanatory presentations, and it was concluded with the realization of the pilot demonstration.

The demonstration was part of both the EC-funded H2020 MOSES and AEGIS sister projects.

The event agenda as well as MOSES Pilot 3 demo videos and related presentation and photo material are available in the following link: <https://moses-h2020.eu/moses-pilot-3-demonstration-robotic-container-handling-system-28-09-2023/>.

The Pilot 3 Exploitation Workshop

The Exploitation workshop on MOSES Robotic Container Handling System took place virtually on November 15, 2023, at 10.00-12.00 CET, via Zoom platform (Figure 18).



Figure 18 Pilot 3 Exploitation Workshop dissemination banner

The Exploitation workshop on MOSES Robotic Container Handling System aimed to present the corresponding pilot demonstration outcomes and gather stakeholders' viewpoints on how MOSES can sustain a roadmap for post-project exploitation.

The event agenda as well as MOSES Pilot 3 demo video and presentation and photo material are available in the following link: <https://moses-h2020.eu/2nd-exploitation-workshop-on-moses-robotic-container-handling-system/>.

4.5 MOSES Final event

In the context of MOSES project two final events were organized and conducted during the last two months of the project's official end. Detailed information is given in the following sub-sections.

4.5.1 MOSES joint final event

On November 7, 2023, the maritime future came alive as the AEGIS, AUTOSHIP, and MOSES projects joined forces in Rotterdam for their joint event (Figure 19), 'Navigating the Future of European Waters with Autonomous Innovation,' right in the heart of Europort, the international maritime exhibition and meeting place for innovative technology and complex shipbuilding, organized in the world port city of Rotterdam.



Figure 19 Dissemination flyer of MOSES, AEGIS & AUTOSHIP joint final event

The event delved deep into discussion on market, technology, and policy developments that are enabling autonomy to have a significant impact on the waterborne sector in the EU, fostering the needed modal shift toward more efficient and greener waterborne transport, and brought together the leading experts in the field to discuss the latest developments.

The day commenced with esteemed keynote speakers, Susanne Lanzersforfer (CINEA) and Alexander Hoffmann (DG MOVE), offering a comprehensive overview of CINEA – European Climate, Infrastructure, and Environment Executive Agency. Their insightful presentation covered the agency’s projects in waterborne automation, along with a detailed discussion on the priorities outlined by the European Commission.

A number of different sessions were organized as part of this event and very interesting presentations were also delivered by key prominent speakers.

All presentations, as well as the agenda, photo material and the event press release are available in the following link: <https://moses-h2020.eu/moses-joint-final-event-with-aegis-autoship-07-11-2023-2/>.

4.5.2 MOSES hybrid final event.

MOSES Final Event took place, in a hybrid format, on December 5, 2023, at 09.00-15.00 CET. This event marked the culmination of a transformative journey in the realm of short-sea shipping (Figure 20).

MOSES final event was hosted physically in Piraeus Chamber of Commerce & Industry, in Piraeus, Greece by the project partner Hellenic Shipowners Association (SAT) and virtually on the MS Team platform.



Figure 20 Dissemination flyer of MOSES final event

This final event marked the successful end of the project activities. All partners presented their activities and the derived outcomes.

The event agenda as well as photo material are available in the following link: <https://moses-h2020.eu/moses-final-event-05-12-2023/>.

4.6 Other activities

In the context of the other activities that took place within the second half of the project the following two are included:

1. MOSES was mentioned as one of the EU research projects in the *“Waterborne Transport Projects - Horizon 2020 projects managed by CINEA and opportunities for synergies”*. This brochure presents a comprehensive overview of the Horizon 2020 waterborne transport projects and examples of synergies with the Connecting Europe Facility transport programme managed by CINEA. More information about the brochure can be found in the following link: https://cinea.ec.europa.eu/publications/h2020-waterborne-transport-projects_en
2. The European project MOSES had the great honour to be awarded by the Institute of Logistics Management of Greece (ILME), receiving the Logistics Excellence Award *“Alexander the Great – Project of the Year 2022”*. The award ceremony was organized in the framework of the 6th International Logistics Forum which took place on June 1, 2023, at the Harokopio University of Athens. Mr. Stathis Makandasis, Director of Logistics at Delta Foods SA, presented the awards, while the MOSES award was received by Dr. Angelos Amditis Research & Development Director of ICCS/NTUA. The aim of the Alexander the Great award

is to highlight projects, innovative solutions and best practices and at the same time to strengthen the extroversion of Greek Logistics. The awarded project will represent Greece in the annual Pan-European Competition of the ELA Awards organized by the European Logistics Association – ELA with entries from 34 member countries. More information is available in the following link: <https://moses-h2020.eu/moses-project-awarded-as-project-of-the-year-2022-by-ilme-01-06-2023/>.

5. MOSES Clustering & Networking activities

MOSES project aimed at strengthening relationships with the entire community involved in the maritime and shipping domain, which is made up of different types of actors. The identification and interaction with related projects, and any thematic cluster projects added to the stakeholders' community, were of crucial importance.

MOSES clustering and networking activities with existing initiatives, projects and stakeholders have been identified and organized in order to exploit synergies in terms of content sharing, exchange of good practices and joint dissemination for maximizing impact networking thanks to external events.

5.1 Clustering activities

In the context of MOSES clustering activities, several joint activities have taken place in collaboration with other EU projects from M19 till the official project end on M42. Specifically, Table 8 summarises the activities that have been conducted jointly by MOSES and other EU research projects.

Table 8 MOSES Joint activities EU research projects

Joint Activities with other EU projects	Type of dissemination activity	Link
Joint Webinar on Cargo Unit Standardisation with AEGIS & ALICE, virtual, 08/11/2021, NTUA	Presentation entitled " <i>The MOSES project: What are the possibilities within freight transport, how can autonomy attract cargo to waterborne transport?</i> "	https://moses-h2020.eu/webinar-on-cargo-unit-standardisation/
NOVIMOVE Joint EU Smart Shipping & Logistics Platform meeting with PLATINA3, ENTRANCE, BOOSTLOG, IW-NET, AUTOSHIP, AEGIS, Current Direct, ST4W, NOVIMOVE, AUTOBarge and LASTING, virtual, 06/04/2022, NTUA	Presentation entitled " <i>MOSES concept and innovations: Indicators of success and ambition</i> "	https://moses-h2020.eu/novimove-joint-eu-smart-shipping-logistics-platform/
Nor-Shipping 2022 with AUTOSHIP-AEGIS, Oslo, 04-07/04/2022, NTUA	MOSES video showcased	https://moses-h2020.eu/nor-shipping-2022/
Transport Research Arena (TRA) Conference 2022 with AUTOSHIP-AEGIS, Lisbon, 14-17/11/2022, NTUA	A joint Special Session 51 took place, entitled " <i>Safe and efficient modal shift from roads to waterways: Automated technologies and processes, human-autonomy</i> "	https://moses-h2020.eu/transport-research-arena-tra-2022-14-17-11-2022/

Joint Activities with other EU projects	Type of dissemination activity	Link
	<p><i>interactions”, with AEGIS project and AUTOSHIP project.</i> MOSES Presentation entitled <i>“The necessity of digital as well as physical automation for sustainable modal shifts”</i></p> <p>A paper Presentation entitled <i>“Paving the way for the future of Short Sea Shipping: The MOSES project”</i></p>	
<p>Inland Navigation Week 2023, with AUTOSHIP-AEGIS-SEEMLESS-NOVIMOVE-IW-NET-CRISTAL project-reNEW-PLOTO, Brussels and online, 20-24/03/2023, NTUA</p>	<p>Presentation entitled <i>“The MOSES Project: Automated and autonomous technologies for modal shift to Short Sea Shipping”</i></p>	<p>https://moses-h2020.eu/inland-navigation-week-2023-21-03-2023/</p>
<p>15th ITS European Congress with AUTOSHIP, AEGIS and SEAMLESS, Lisbon, 22-24/05/2023, NTUA</p>	<p>Presentation entitled <i>“Automated cargo handling for autonomous ships: The MOSES project”</i></p>	<p>https://moses-h2020.eu/15th-its-european-congress-22-24-05-2023/</p>
<p>Synergy meeting with Healthy Ship 4U, Online, 30/10/2023, NTUA, SEAB</p>	<p>Talk about the potential synergies between the projects</p>	<p>https://moses-h2020.eu/synergy-meeting-with-healthy-ship-4u-30-10-2023/</p>
<p>Joint final event with AUTOSHIP, & AEGIS, Rotterdam, 07/11/2023, SEAB, NTUA, TNO, MACGREGOR, MARIN, MHM, TREL, VPF</p>	<p>Presentation entitled <i>“Autonomous container handling with ship cranes”</i></p> <p>Presentation entitled <i>“Remote support of robotic container handling systems”</i></p> <p>Presentation entitled <i>“How safe do we need to be?”</i></p>	<p>https://moses-h2020.eu/moses-joint-final-event-with-aegis-autoship-07-11-2023-2/</p> <p>https://moses-h2020.eu/moses-joint-final-event-with-aegis-autoship-07-11-2023/</p>

5.2 Networking activities

The main aim of MOSES networking activities was to maximise the impact of the communication and dissemination of results amongst the relevant stakeholders, to exchange technical information and to contribute to the dissemination of top-level, high-quality EU funding programmes and support European Research and Innovation Actions.

MOSES partners embraced every opportunity to discuss MOSES developments within related organisations, associations, and networks where they already participate, and

technical advances are presented in respective technical meetings and fora. Networking with relevant associations, organisations and European R&D initiatives was very important since this ensured knowledge interchange between key actors and the adoption of proposed solutions.

Table 9 provides a summary of the networking organisations, platforms, associations, agencies etc, from M19 to M42.

Table 9 MOSES networking activities

Networking party	Event	Link
ALICE¹	Transport Research Arena (TRA) Conference 2022,14-17.11.2022	https://moses-h2020.eu/transport-research-arena-tra-2022-14-17-11-2022/
	IPIC 2023, 13-15.06.2023	https://moses-h2020.eu/ipic2023-13-15-06-2023/
EMSA²	EMSA Workshop on Maritime Autonomous Surface Ships (MASS), 29.11.2022	https://moses-h2020.eu/emsaworkshop-on-maritime-autonomous-surface-ships-mass-29-11-2022/
Waterborne³	Transport Research Arena (TRA) Conference 2022,14-17.11.2022	https://moses-h2020.eu/transport-research-arena-tra-2022-14-17-11-2022/
ERTICO⁴	Transport Research Arena (TRA) Conference 2022,14-17.11.2022	https://moses-h2020.eu/transport-research-arena-tra-2022-14-17-11-2022/
ILME⁵	6th International Logistics Forum, 01.06.2023	https://moses-h2020.eu/moses-project-awarded-as-project-of-the-year-2022-by-ilme-01-06-2023/

¹ European Technology Platform ALICE, <https://www.etp-logistics.eu/>

² European Maritime Safety Agency, <https://www.emsa.europa.eu/>

³ European research and innovation platform for waterborne industries <https://www.waterborne.eu/>

⁴ ERTICO – ITS Europe, <https://ertico.com/>

⁵ Institute of Logistics Management of Greece (ILME), <https://ilme.gr/>

6. Communication & Dissemination KPIs

The effectiveness of MOSES’s communication, dissemination and scientific activities was monitored constantly on a monthly basis. Periodic evaluation was considered vital to guarantee that all identified target audiences are properly reached and provided with appropriate information and content on project’s assets and to generate feedback and get insights on what works and what needs refinement.

Therefore, a number of quantitative measurable targets (Key Performance Indicators) for dissemination and communication activities has been set, since the proposal phase, in order to ensure that the desired impact is achieved. The KPI matrix was regularly updated on a monthly basis (Figure 21).

Having a look at the big picture, the majority of MOSES defined KPIs have been successfully met and fulfilled! However, by taking into consideration that MOSES post project exploitation has just started, it is obvious that efforts will be further strengthened, after project end, towards the direction of MOSES scientific dissemination (papers in conference proceedings and publications in scientific journals).

COMMUNICATION KPI MATRIX			
KPIs Names	Current values (M42)	Threshold for the 3 rd year (M42)	Result (3 rd year)
Project logo	1	1	✔
Brand guidelines	1	1	✔
MOSES Templates	1	1	✔
Illustration & graphics (for social + concept image)	1	1	✔
Factsheet	1	1	✔
Leaflet/Brochure	2	2	✔
Poster	3	3	✔
Roll-up banners	5	5	✔
Project video	1	1	✔
E-newsletter	5	4	✔
Website	1	1	✔
Twitter members end year	803	800	✔
LinkedIn members end year	803	800	✔
Media articles	46	30	✔
TV/Radio interview	1	1	✔
Publication in EU communication tools	4	4	✔
Announcements in H2020 social media	6	6	✔
Presentations in conferences/events (at least 10 a year)	69	60	✔
SIS	6	3	✔
Stands/demonstrations	12	2	✔
Papers/posters in conference proceedings	17	25	✘
Publication in renowned scientific journals	6	8	✘
Cluster sessions at a yearly basis	10	3	✔
Pilot Demos	3	3	✔
Final Conference	1	1	✔
Members of Stakeholder community	3000	30	✔
Stakeholders contacted during the project	3000	100	✔
Links with RnD projects	23	10	✔
Links with associations/fora/technical committees	10	10	✔
Announcements per partner	10	4	✔

Figure 21 MOSES Key performance indicators

7. Conclusions

The overall aim of this document was to provide a summary of the MOSES communication, dissemination and scientific activities implemented from M19 (January 2022) until the end of the project on M42 (December 2023).

The main online communication and dissemination channels, such as the website and social media (Twitter, LinkedIn, and YouTube) have been the backbone of all communication and dissemination activities. Those channels have grown at a satisfying rate and successfully targeted the identified audiences with regular relevant content. MOSES consortium partners have been actively engaged and contributed to the dissemination of MOSES vision, results, and outcomes via the participation in several events and the production of press, technical and scientific material.

Fruitful synergies and collaborations have been established between MOSES and other sister and related projects, as well as prominent networks. They all considered it as mutually beneficial to create liaisons towards disseminating MOSES project outcomes and sustainable links with prominent members of the stakeholder community.

References

- [1] Mailchimp: All-in-One Marketing Platform, <https://mailchimp.com/> (last accessed 27/12/2023)
- [2] Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020”, Version 3.2, 21 March 2017, http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oapilot-guide_en.pdf (last accessed 27/12/2023)