



### AutoMated Vessels and Supply Chain Optimisation for Sustainable Short SEa Shipping

### D8.6: MOSES Final Exploitation Plan

Document Identification			
Status	Final	Due Date	31 December 2023
Version	1.0	Submission Date	30 December 2023
Related WP	WP8	Document Reference	D.8.6
Related Deliverable(s)	D2.1, D2.2, D2.2, D2.3 D6.1, D8.1, D8.2, D8.3, D8.4, D8.5, D8.7, D8.8	Dissemination Level	СО
Lead Participant	CIRCLE	Document Type:	Report
Contributors	All partners	Lead Author	Reza Karimpour
		Reviewers	Mirjam Huis in 't Veld (TNO)
			Janne Suominen (MCGRSWE)





## **Document Information**

List of Contributors		
First Name	Last Name	Partner
Reza	Karimpour	CIRCLE
Elena	Krikigianni	SEAB
Konstantinos	Louzis	NTUA
Ilias	Kotsidis	ESI
Konstantinos	Nikolopoulos	CORE
Mirjam	Huis in 't Veld	TNO
Gerco	HagesteijnCO	MARIN
Hans	Cozijn	MARIN
Fotis	Oikonomou	DANAOS
Igancio	Benítez Sánchez	VPF
Panagiota	Douska	DNV
Chara	Georgopoulou	DNV
Laura	Herrera	ASTANDER
Stavros	Tsagalas	PCT
Nikolaos	Vardalachos	МНМ
David	Tidy	TRELL
Janne	Suominen	MACGREGOR
Søren Frede	Pedersen	TUCO

Document History			
Version	Date	Change editors	Changes
0.1	30.03.2023	Reza Karimpour	Structuring all chapters and preparing the table of contents. Provision of content in chapters 1 and 2.
0.2	11.04.2023	Reza Karimpour	Revised based on feedback received from Konstantinos Nikolopoulos (CORE) and Konstantinos Louzis (NTUA).
0.3	27.06.2023	Reza Karimpour	Revised the Structure of the document.
0.4	31.09.2023	Reza Karimpour	Expanded the details of chapters.
0.5	11.12.2023	Reza Karimpour	Included the results of exploitation workshops and experts' comments.





Document History			
Version	Date	Change editors	Changes
0.6	22.12.2023	Reza Karimpour	Included feedback and suggested changes from the assigned reviewers.
0.7	27.12.2023	Reza Karimpour	Included feedback and suggested changes from the WP8 leader
1.0	29.12.2023		Final version ready for submission

Quality Control		
Role	Who (Partner short name)	Approval Date
Deliverable leader	CIRCLE	29.12.2023
Quality manager	NTUA	29.12.2023
Project Coordinator	NTUA	29.12.2023





### **Table of Contents**

Executive Summary
1 Introduction to Exploitation Task and MOSES Innovations
1.1 Purpose of the Final Exploitation Plan Deliverable9
1.2 Methodology to Achieve Final Exploitation Plan9
1.3 Structure and Scope of the Final Exploitation Plan Deliverable 11
1.4 MOSES Key Exploitable Results (KERs) vs MOSES Innovations
1.4.1 MOSES Pilots Innovations Concept
1.4.2 Key Exploitable Results (KERs) components of each MOSES Innovation15
1.4.3 Preliminary Exploitation Strategy in D8.5 Intermediate Exploitation Plan16
2 Strategies for Exploiting MOSES Key Exploitable Results & MOSES Pilots Innovations 17
2.1 Exploitation Activities during the MOSES Project in synergy with the dissemination task 17
2.2 Exploitation Advisory Board Consultation
2.3 Literature Review on both KERs of MOSES Pilots Demonstrations
2.4 Exploitation Survey on both Key Exploitable Results (KERs) & MOSES Pilot Innovations 26
2.5 Exploitation Workshops on MOSES Pilots' Demonstrations
2.5.1 Exploitation workshop on the MOSES AutoDock System (Pilot 1)
2.5.2 Exploitation workshop on the autonomous sailing of MOSES Innovative Feeder Vesse (Pilot 2)
2.5.3 Exploitation workshop on the MOSES Robotic Container Handling System (Pilot 3) 36
2.5.4 International Workshop in conjunction with the MOSES Final Event
3 Exploitation Recommendations for MOSES KERs and MOSES Three Pilots40
3.1 Analyses & Exploitation Recommendations for Key Exploitable Results (KERs) for Pilot 141
3.1.1 Exploitation Recommendations Pilot 1: AutoDock System
3.2 Analyses & Exploitation Recommendations for Key Exploitable Results (KERs) for Pilot 251
3.2.1 Exploitation Recommendations Pilot 2: Innovative Feeder Vessel
3.3 Analyses & Exploitation Recommendations for Key Exploitable Results (KERs) for Pilot 357
3.3.1 Exploitation Recommendations Pilot 3: Robotic Container Handling System 60
3.4 Analyses & Exploitation Recommendations for standalone Key Exploitable Results (KERs)61
4 Conclusion
References
_





D8.6: MOSES Final Exploitation Plan	M >> E 5
Annex A. MOSES Projects Deliverables	74
Annex B. MOSES Conferences, Seminars, and Workshops	76
Annex C. Homepage of the MOSES Project Website	79
Annex D. MOSES Exploitation Advisory Board	80
Annex E. Exploitation Workshops material	81
Annex F. International Workshop Agenda in Conjunction with Final Event	
List of Tables	
Table 1 MOSES Exploitable End Results matched/grouped with Pilots Demonstrat	ions 15
Table 2 Preliminary Literature Review on MOSES KERs	23
Table 3 Template of the survey questionnaire	28
Table 4 Three Exploitation Workshops following Three MOSES Pilots Demos	32
List of Figures	
Figure 1 Timeline of Exploitation Deliverables	8
Figure 2 General methodological approach the MOSES Final Exploitation Plan	10
$\label{thm:problem} \mbox{Figure 3 Detailed methodological approach to the MOSES Final Exploitation Plan.}$	11
Figure 4 MOSES concept and Innovations.	13
Figure 5 Exploitation activities during the MOSES Project in synergy with the disse	mination task. 17
Figure 6 Exploitation Advisory Board Consultation.	21
Figure 7 Literature Review and Desktop Analysis on KERs of 3 MOSES Pilots Innov	ations 22
Figure 8 Exploitation Survey on both Key Exploitable Results (KERs) & MOSES Pilo	t Innovations 27
Figure 9 MOSES Three Pilot Demonstrations at their sites	
Figure 10 Exploitation Workshops on MOSES Pilots' Demonstrations	
Figure 11 The International Workshop in conjunction with the MOSES final event.	
Figure 12 MOSES Exploitation with details of IPR, Market analysis, and Business m	
development	
Figure 13 Roadmap for Implementing Exploitation Strategy of MOSES Pilot 1: Auto	•
Figure 14 Roadmap for Implementing Exploitation Strategy of MOSES Pilot 2: Inno	
Vessel	56



Figure 15 Roadmap for Implementing Exploitation Strategy of MOSES Pilot 3: Robotic Container 



# **List of Acronyms**

Abbreviation/Acronym	Description
AGA	Annotated Model Grant Agreement
CEB	Common Exploitation Booster
ConOps	Concept of Operations
D1.3	Deliverable number 3 belonging to WP 1
D2.1	Deliverable number 1 belonging to WP 2
D2.3	Deliverable number 3 belonging to WP 2
D8.5	Deliverable number 5 belonging to WP 8
DSS	Deep Sea Shipping
EA	Exploitable Assets
EC	European Commission
ECSA	European Community Shipowners' Associations
ESPO	European Sea Ports Organisation
ER	Exploitable Results
EU	European Union
GLE	MacGregor electric drive multipurpose crane (type GLE)
IPR	Intellectual Property Rights
IMU	Inertial Measurement Unit
IOSS	Intelligent Operator Support System
KERs	Key Exploitable Results
LCA	Life Cycle Analysis
MASS	Maritime Autonomous Surface Ship
MED	Mediterranean Sea
MOSES	AutoMated Vessels and Supply Chain Optimisation for Sustainable
NPDL	New Product Development and Launch
PEDR	Plan for the Exploitation and Dissemination of Results
R&D	Research and Development
RCHS	Robotic Container Handling System
SPEC	Ship Power and Energy Concepts
SSS	Short Sea Shipping
TAM	Total Available Market
TEN-T	Trans-European Transport Network
TEU	Twenty-foot Equivalent Unit
TRA	Transport Research Arena
WIPO	World Intellectual Property Organization
WP	Work Package





#### **Executive Summary**

The European supply chain is anchored in its ports, facilitating approximately 74% of imports and exports. <sup>1</sup>Though the importance of both Deep Sea Shipping (DSS) and Short Sea Shipping (SSS) is unequivocal, there's an evident disjunction in their integrated operations. The MOSES project emerged as an innovative solution, aiming to synergize these sectors. By incorporating advanced technologies and systems, MOSES endeavours to enhance port efficiencies, minimize berthing times, and optimize cargo transfers.

The 'Final Exploitation Plan (D8.6)' is a thorough strategy that outlines the project's vision to harness its outcomes for maximum societal, economic, and scientific returns. This blueprint meticulously details the project's journey from conception to potential market integration, ensuring that the fruits of this initiative are not confined to project documentation, but evolve into actionable solutions, services, or products that leave an indelible mark on the European supply chain and European Short Sea Shipping sectors.

Starting with a clear explanation of why the exploitation strategy exists, the document helps understand MOSES's primary goals. It highlights the new solutions and methods developed during the project. The story goes beyond just the project's lead time, explaining plans for using MOSES's main results. Every plan is carefully made, matching the importance of each end result. The final chapter looks into the future, covering the next steps, possible challenges, ways to keep going, and how it might affect EU rules. Some key highlights follow:

- The "MOSES feeder" stands as a testament to the future of SSS. This avant-garde hybrid electric feeder vessel, bolstered with a robotic system, promises to revolutionize operations at smaller ports, thereby amplifying their role in the supply chain.
- "MOSES AutoDock", with its automated prowess, is poised to be a game-changer, potentially truncating docking times and amplifying port efficiencies.
- The inception of the "MOSES platform" epitomizes the project's dedication to digital evolution, positioning itself as a pioneering digital matchmaker optimized for SSS services.

The robust Intellectual Property Rights (IPR) framework is pivotal to these innovations, ensuring that these solutions enjoy protection and are primed for commercial ventures, partnerships, and licensing propositions. In its foresight, the plan transcends the project's duration, envisioning a post-project era that underscores longevity, sustainable impact, and consistent value generation for the EU's maritime sector. MOSES project is more than a solution—it's a visionary outline for an integrated, efficient, and technologically forward maritime future. This exploitation plan crystallizes that vision, ensuring the project's lasting impact on the European shipping tapestry.

<sup>&</sup>lt;sup>1</sup> https://www.onthemosway.eu/wp-content/themes/%23onthemosway/img/MoS-DIP-FINAL.pdf



