EUROPEAN COMMISSION - **HORIZON EUROPE PROGRAMME**

**CLUSTER** CLIMATE, ENERGY AND MOBILITY
**TOPIC** HORIZON-CL5-2022-D5-01-01

Funded by
the European Union

# NEMOSHIP

## NEW MODULAR ELECTRICAL ARCHITECTURE AND DIGITAL PLATFORM TO OPTIMISE LARGE BATTERY SYSTEMS ON SHIPS

GRANT AGREEMENT No. 101096324

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# D9.3: DEC plan and report

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March 2023

## Report details

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| **Deliverable No.** | D9.3 |
| **Deliverable Title** | DEC plan and report |
| **Deliverable Date** | 31/03/2023 |
| **Dissemination Level** | PU |
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## Document History

| Version | Date | Editors | Description |
|---|---|---|---|
| **V1.0** | 07/03/2023 | Margaux FAURE (IEIC) | First draft to review |
| **V2.0** | 31/03/2023 | Guénaël Le Solliec (CEA) | Reviewed version |
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This project has received funding from the European Union's Horizon Europe Research and Innovation programme under grant agreement No 101096324. The information and views set out in this publication does not necessarily reflect the official opinion of the European Commission. Neither the European Union institutions and bodies nor any person acting on their behalf, may be held responsible for the use which may be made of the information contained therein.

## Project Summary

The ambition of the NEMOSHIP project is to develop, test and demonstrate new innovative technologies, methodologies and guidelines in order to better optimise large battery electric power within hybrid and fully electric ships. The project will act as a key enabler for the new co-programmed European Partnership Zero Emission Waterborne Transport (ZEWT) roadmap to reach IMO objectives about reduction of GHG emissions from waterborne transport by 2030 and 2050.

To reach this ambition, NEMOSHIP will develop a modular and standardised battery energy storage solution enabling to exploit heterogeneous storage units and a cloud-based digital platform enabling a data-driven optimal and safe exploitation. The project will demonstrate these innovations at TRL 7 maturity for hybrid ships and their adaptability for full-electric ships thanks to a retrofitted hybrid Offshore Service Vessel (diesel/electric propulsion), a newly designed hybrid cruise vessel (LNG/electric propulsion) and a semi-virtual demonstration for two additional full-electric vessels such as ferries and short-sea shipping.

The NEMOSHIP consortium estimates these innovations will contribute by 2030 in the electrification of about 7% of the European fleet and the reduction by 30% of EU maritime GHG emissions compared to business as usual scenario.

The NEMOSHIP consortium is composed of 11 partners (3 RTO, 1 SME, 7 large companies) and covers the whole value chain, from research-oriented partners to software developers, energy system designers, integration partners, naval architects and end-users.

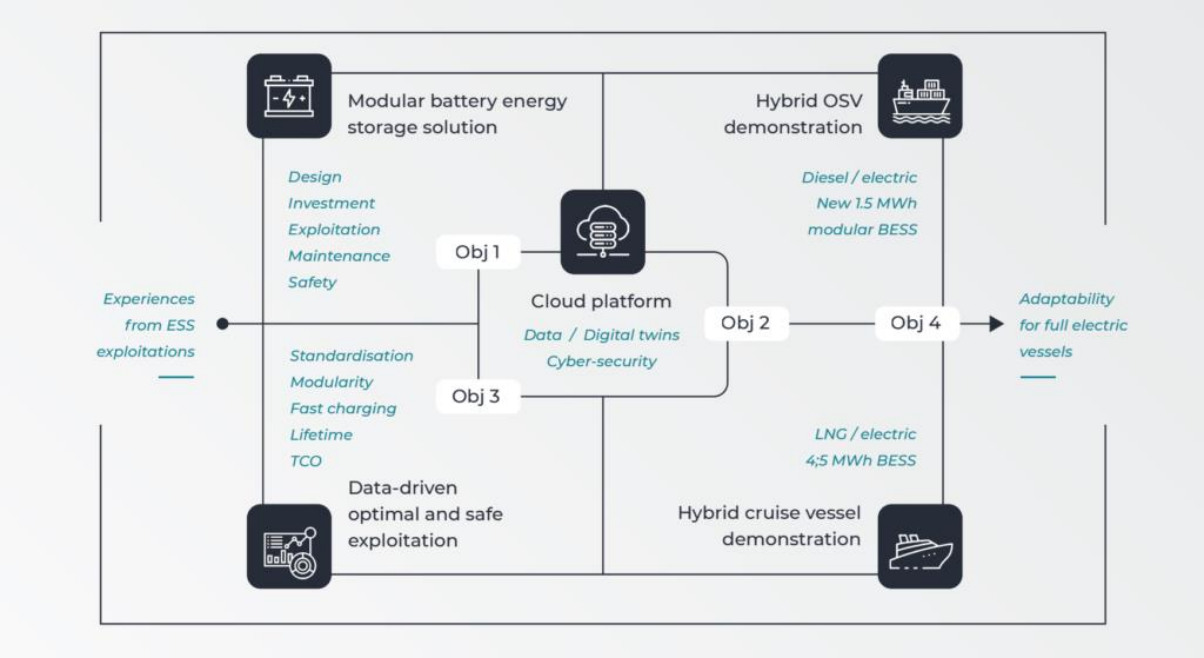


*Figure 1: NEMOSHIP objectives at a glance*

# Table of content

# 1 Introduction

The purpose of this document is to establish general plans of dissemination activities that are going to be carried out in WP9 in order to **ensure NEMOSHIP success and inform different target groups about the achievements of the project consortium**. The objective is to **promote and make the project known** to ship owners, operators, shipyards and ship designers (main target).

A preliminary schedule of dissemination activities is provided and described in the document:

- Part 2 describes the main dissemination objectives and the targeted audiences
- Part 3 presents the dissemination strategy
- Part 4 presents the different tools used for the dissemination
- Part 5 focuses on the intellectual property

The preliminary plan could evolve according to specific needs during the project. The DEC plan will be evaluated and updated every 12 months by the General Assembly, based on the feedback from the range of stakeholders participating in the project activities.

For a comprehensive view of the Project and of the NEMOSHIP Consortium, the Description of Action (DoA) and the Consortium Agreement (CA) should be consulted.

# 2 Objectives per target

The main objectives of dissemination for this project are:

- To inform, externally, about the activities of the project
- To inform the industry community, researchers and the wider community of the project results (those that are not sensitive)
- To prepare the use and exploitation of the project results after its end (those that are not sensitive), designing the strategy to consolidate the project demonstration.

Main target:

- **NEMOSHIP partners**: ensure smooth communication among partners and in working-groups
- **Ship owners & operators, shipyards, ship designers:** to make known the results of the project in order to prepare their commercialization. Identify future potential partners to continue the development of the results obtained
- **Equipment manufacturers:** promote the project to equipment manufacturers, to communicate the project's standardization work
- **Maritime battery manufacturers**: communicate the solution to prepare for market access for each outcome and maximize adoption across the industry
- **Engineering Service Companies:** communicate the solution to prepare for market access for each of the outcomes

Second target:

- **Local, regional, national and European policymakers**: share technical advances to enrich the State of-the-Art and increase the knowledge on new algorithms, electrical architecture etc.

Third target:

- **Broader public:** inform the broader public about the ongoing project and what to expect in the future from electric vessels
- **Medias:** inform on the NEMOSHIP project and its activities and promote them

To **summarize**, the following table provides an overview of these target audiences, the related objectives and content:

| Target audiences | NEMOSHIP objectives | Content to be disseminated |
|---|---|---|
| *Ship owners & operators, shipyards, ship designers* | Make the project outcomes known, to prepare their commercialisation. Identify future potential partners to further develop obtained outcomes. | Information and data about the NEMOSHIP solutions, their quantified benefits, maturity level and practical implementation in their context. |
| *Equipment manufacturers* | Make the project known by equipment manufacturers, in order to communicate about the project's work on standardisation. | Information and data about the NEMOSHIP solutions, their quantified benefits, maturity level and practical implementation in their context. |
| *Maritime battery manufacturers* | Make the solution known to prepare the market access for each of the outcomes and maximise its adoption by the whole sector. | Information on how the NEMOSHIP electric infrastructure can benefit their systems. |

| | | |
|---|---|---|
| *Engineering Service Companies* | Make the solution known to prepare the market access for each of the outcomes. | Information in a wide variety of ways, focused on making specific knowledge usable outside of the immediate context of NEMOSHIP. |
| *Local, regional, national and European policymakers* | Promote the benefits of NEMOSHIP solutions and raise awareness, especially towards promoting potential standardisation of results. | Information and data, quantified benefits and maturity level of the NEMOSHIP solutions in their contexts. |
| *Academic world, researchers* | Share technical advances to enrich the State-of-the-Art and increase the knowledge on new algorithms, electrical architecture etc. | Papers and open data to understand the disruptive nature of NEMOSHIP results. |
| *Broader public* | Inform the broader public about the ongoing project and what to expect in the future from electric vessels. | Easy to understand accessible data about how the project outcomes will make a difference for consumers (lower emissions, less pollution, better air quality, less noise, …) |

*Table 1: target audiences, objectives and content*

# 3 Actions and objectives

## 3.1 Initial dissemination strategy

To be able to successfully address all the above-mentioned audiences (part 2 of this document) and bring to them the right tailormade content, the consortium has set out an initial dissemination strategy outlined in the table below. For each measure, roles and responsibilities have been set out. Initial KPIs and objectives have been defined in accordance with the needs of the project exploitation plan, as well as the ones from each individual partner:

| D&C actions | Description and target audiences | KPIs | Involved Partners |
|---|---|---|---|
| Communication material & platforms | | | |
| Project website setup and animation | An official project website will be published soon after the start of the project and serve as the focal point for all dissemination and communication activities towards all audiences. The website will make available key outcomes and technical details (reports and deliverable abstracts) on a regular basis. All content shared at public events or workshops will also be made available for download. All project communications (as well as partner communications) will always mention the website. | **>200 unique monthly visitors** by the end of the project<br>Deliverables downloaded **>1000 times** by the end of the project | Managed by IEIC<br>All partners will be involved in the creation and proofreading of the disseminated content. |
| Project social media setup | An official project LinkedIn account will be created along the project website. The account | **>500 followers** from | |

| | | | |
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| and animation | will allow to target specific audiences more easily and push tailormade technical content to them. All content published on the website will be communicated through the social media account. | the maritime industry<br>**>50** policy makers and professional associations | |
| Periodic newsletter writing | An official project newsletter will be published every 6 months. The newsletter will include all latest news of the project at technical level. The newsletter aims at including technical data to interest ship owners & operators, shipyards and ship designers across all vessel categories and keep them attracted. | **>200 subscribers** by the end of the project | |
| Video production | To facilitate the communication to all kinds of stakeholders and massify the impact of dissemination activities, videos will be produced during the project as they are more viral than text. Technical videos will explain how the various technologies work and the performance which can be achieved. A final video will be created near the end to present achieved results. | **>4 videos** created by end of the project<br>**>500 views per video** before end of project | CEA (1+), PONANT (1), SOLSTAD (1), ELKON (1) |
| Targeted dissemination activities | | | |
| Participation to fairs and congresses | Partners of the project intend to participate to technical congresses and fairs to present the project, disseminate its results and try to attract future potential customers.<br>**Key targeted fairs and conferences**: Global Maritime Environmental Congress (GMEC) during SMM 2024, Seatrade Cruise Global Conference, Storage Global Conference, Battery Innovation days, EES EUROPE<br>Special presence shall be sought at the **Waterborne - ECMAR Brokerage Event** where the Zero-Emission Waterborne Transport (ZEWT) Partnership projects are presented and provide an overview of the opportunities in the next round of calls for proposals under Horizon Europe. | **>25 events** to which partners of the consortium are present and discuss the project<br>**>100 contacts** made across ship owners & operators, shipyards and ship designers | CEA (3), CIDETEC (3), PONANT (3), SDI (3), ELKON (3), SOLSTAD (5), EQUINOR (5), CORVUS (3), SIEMENS (3) |
| Presentation to the | Partners also intend to contribute and disseminate the knowledge developed | | |

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|---|---|---|---|
| industry through networks | throughout the project to all network events in which they usually participate:<br>**Professional associations**: NEOPOLIA, T2EM (French coalition for the maritime eco-energetic transition), CLIA (Cruise Lines International Association), Armateurs de France (French Association of Shipowners), IAATO (International Association of Antarctic Tour Operators), AECO (Association of Arctic Expedition Cruise Operators), Norwegian Shipowners Ass.<br>**Clusters**: Pôle Mer Bretagne Atlantique, MaritimeCleantech, Maritime Battery Forum, GettingToZero Coalittion, ACICAE, Cluster de Energia, Industria Emobility, LIPLANET<br>**EU/national partnerships**: EU Waterborne, GICAN, International Marine Contractors Association (IMCA), International Marine Purchasing Association (IMPA), AEPIBAL, BATTERYPLAT, BEPA | | |
| Presentation to the research community | As the project involves important research activities, research papers will be published on a regular basis and either presented at conferences or published in scientific journals.<br>**Papers could be published** at *Journal of Power Sources, Energies MDPI, MDPI batteries, Batteries, IEEE Transactions on Vehicular Technology, Energy, Energies* | **>4 peer reviewed papers** by project end, presented at conferences | CEA (2), CIDETEC (1), VUB (2) |
| Organisation of technical webinars & workshops | Multiple webinars & workshops will be organised throughout the project to engage even more with potential customers. It will be key to present technical aspects of the project and have close discussions and find potential future customers. Webinars will be organised in the second half of the project once the demonstrator will generate the first datasets. | **>5 webinars & workshops** (at least 2 on lessons learnt, 1 on integration, 1 on digital platform)<br>**>150 participants** each | CEA (1), PONANT (1+), SDI (1), SOLSTAD (1+), EQUINOR (1), ELKON (1), SIEMENS (1) |

| | | | |
|---|---|---|---|
| Organisation of key events at Brussels | During the lifetime of the project, two large events will be organised to promote the project results all together as a consortium. The first event will be held around M24 when first major results will be available, the second one will be a closing event. The events will be organised in Brussels to attract policy makers. It will also be a key moment to organise hands-on workshops and trainings to interested future customers. | **2 main events** organised **>100 attendance** at each one | All partners |
| Maximising impacts through clustering activities | | | |
| Set-up and animation of a cross-project cluster | Multiple projects will be funded by the European Commission under this topic. In case of funding, the consortium commits to get in contact with fellow funded projects to expend all projects dissemination impacts. Key events and webinars could thus be shared, as well as the LinkedIn account for example. | **Common cluster created** | CEA as coordinator, IEIC as dissemination manager |

*Table 2: Dissemination and Communication KPIs*

The successful completion of these goals will be monitored thoroughly by the coordinator CEA and made possible by the successful dissemination and communication activities.

A first timeline for project dissemination and communication strategy is:

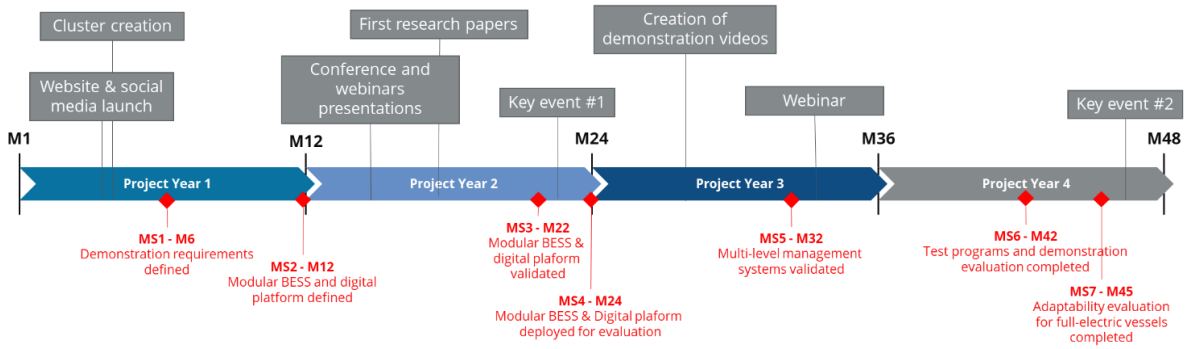


*Figure 2: Timeline for the project dissemination and communication*

## 3.2 BAT-11 clustering projects

To date, two European projects on similar topics have been identified to maximize the results of NEMOSHIP's dissemination and communication activities:

| Project | Description and link to NEMOSHIP | Partner of NEMOSHIP and of this project |
|---|---|---|
| **CURRENT DIRECT** LC-BAT11 2021-2024 | **Objective:** develop and demonstrate an innovative, interchangeable waterborne transport battery system and an Energy as a Service (EaaS) Platform in an operational environment in the Port of Rotterdam. | VUB |
| | **Link:** Guidelines for containerised battery system + digital twin deployment in an operational environment. | |
| **SEABAT** LC-BAT11 2021-2024 | **Objective:** a full-electric maritime hybrid concept based on combining modular high-energy batteries and high-power batteries, novel converter concepts and production technology solutions derived from the automotive sector. | CEA |
| | **Link:** modular / hybrid battery energy storage concept, safety, certification | |

*Table 3: Two BAT-11 projects with links to NEMOSHIP*

The creation of synergy with these projects will contribute to meeting the European Commission's expectations for a collaborative approach. The consortium remains attentive and on the lookout for new projects with points in common with NEMOSHIP

# 4 Dissemination tools

The communication toolkit described in deliverable D9.1 provide the consortium with all the required communication material it might require for dissemination activities.

## 4.1 Project website

https://nemoship.eu/

The above URL should be used whenever referring to the NEMOSHIP website, which is up and running. This interface will be regularly updated to keep up to date. The figure below shows the home page of NEMOSHIP website.

The project web portal will provide an easy-to-use access to information, links to project partners, descriptions of teams involved in the project, a description of the project itself, the project's objectives, innovation, publications arising from the project. Furthermore, events and workshops will be announced on the website. This website is open and accessible to the general public.

For further details on the website see D9.2 – Project website.

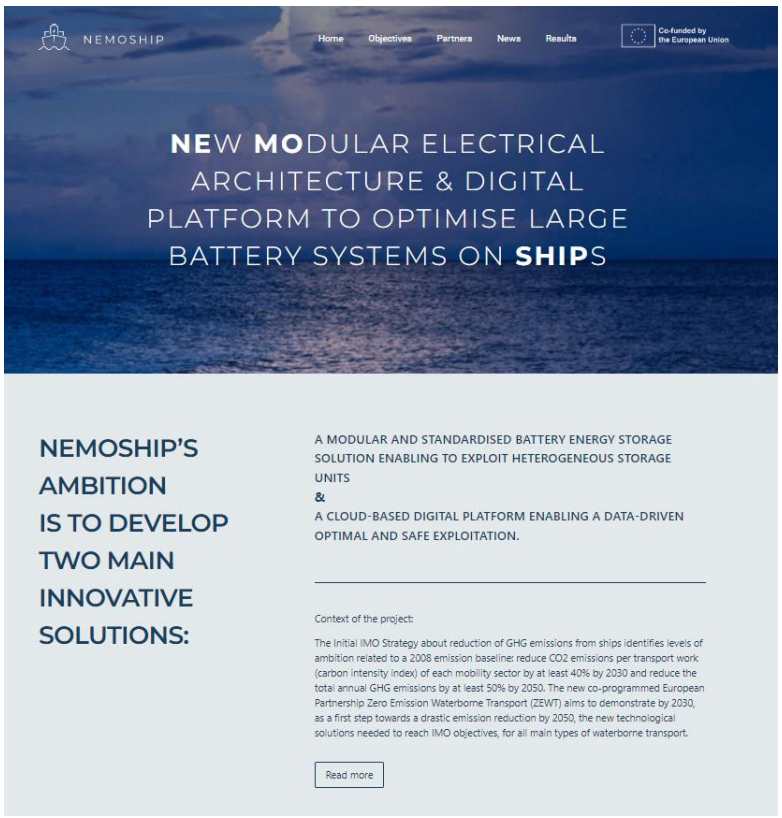


*Figure 3: Home page of the NEMOSHIP website*

## 4.2 Kakemono

A kakemono supports dissemination within workshops and scientific conferences, it was created by IEIC and its design subcontractor.

For further details on the kakemono see D9.1- Communication and dissemination tools.

## 4.3 Social media

A dedicated LinkedIn page for the project was created:
https://www.linkedin.com/company/nemoship/

LinkedIn is a social media platform designed to allow professionals and businesses to connect and network. Through LinkedIn, it is possible to:

- **Reach a targeted audience**: LinkedIn has over 700 million users, making it an excellent platform to connect with professionals interested in the NEMOSHIP project. It is possible to target specific groups, industries, job titles, and geographic locations to ensure that the NEMOSHIP project reaches the right audience.
- **Engage with the audience**: LinkedIn offers a variety of ways to engage with the NEMOSHIP audience, such as creating surveys, asking for feedback, and sharing updates. By engaging with the NEMOSHIP audience, valuable information about their needs and preferences can be gained
- **Leverage LinkedIn Groups**: LinkedIn groups are a great way to connect with like-minded professionals and tell them about NEMOSHIP.
- **Access to analytics**: LinkedIn provides analytics tools that will allow you to track post performance, including views, engagement and clicks.

## 4.4 Events

We encourage NEMOSHIP partners to share with us a picture and some information about the events they participate in that are related to the project, as we aim to make a publication on the NEMOSHIP website, in the "News" section.

The Key targeted fairs and conferences are:

- Global Maritime
- Environmental Congress (GMEC) during SMM 2024, Seatrade
- Cruise Global Conference, Storage Global Conference, Battery

During the lifetime of the project, two large events will be organised to promote the project results all together as a consortium. The first event will be held around M24 when first major results will be available, the second one will be a closing event. The events will be organised in Brussels to attract policy makers. It will also be a key moment to organise hands-on workshops and trainings to interested future customers.

# 5 Dissemination and intellectual property

Since intellectual property (IP) is essential in an IA project, the terms of intellectual property management were described in the Consortium Agreement (CA) as follows:

*"During the Project and for a period of 1 year after the end of the Project, the dissemination of own Results by one or several Parties including but not restricted to publications and presentations, shall be governed by the procedure of Article 17.4 of the Grant Agreement and its Annex 5, Section Dissemination, subject to the following provisions. Prior notice of any planned publication shall be given to the other Parties at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement by written notice to the Coordinator and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted."*

Furthermore, to manage the project's IP, each participant has listed **its background in Attachment 1 of the Consortium Agreement (CA)**, thereby defining its pre-existing not patented IP relative to the other partners.

Concerning patents: each participant executing a task of the project work plan owns the IP limited to the new information, new know-how, or deliverable generated by its own execution of this specific task. Each partner is then responsible for filing patents when necessary. If a patent may be constructed based on overlapping know-how of several partners, the basic principle is that the involved partners will equally share the ownership of the patent and the costs to applying for it. In any case, only scientists who contributed to the innovation, which resulted in the patent, are included in the authors list of the patent.

Concerning publications: The decision of publishing is taken by the consortium on a simple majority vote, before starting to write the paper. The final version to be sent to the editorial office of a scientific journal must be unanimously approved by the consortium. In case the Executive Board agrees to publish some information, the scientists who took part to the project are committed to confidentiality (until the publication of the results in a scientific journal or at a scientific conference).

A list of initial patentable and publishable outcomes to update throughout the project is presented in the table below:

| N° | Project outcomes | Patentable? | Publishable? |
|---|---|---|---|
| 1 | Improved battery technology for optimal integration | **Yes** | **Yes** |
| 2 | Improved ESS systems with better capacity at a lower cost | **Yes** | **Yes** |
| 3 | Battery sizing tool for hybrid battery systems | **No (software)** | **Yes** |
| 4 | Algorithms for an efficient power management for hybrid battery systems in marine applications | **No (software)** | **Yes** |
| 5 | Predictive maintenance and diagnostic tool based on AI techniques in order to improve the battery life and exploitation | **No (software)** | **Yes** |
| 6 | Cloud-based and cyber-secured digital platform for both design and online exploitation of ESSs | **No (software)** | **Yes** |
| 7 | Process of approval and implementation of ESS on retrofitted ships | **No** | **Yes** |
| 8 | Knowledge about the performance of >1MWh ESS systems | **No** | **Yes** |

| | | | |
|---|---|---|---|
| 9 | Experience in comparing the outputs of a digital twin and a complex system as a large e-vessel during 2 years. | **No** | **Yes** |

*Table 3: Potential NEMOSHIP patents and publishable content*

The management of IP conflicts by the consortium is expected to be necessary in some critical cases. To avoid polemics and conflicts, the **Project Coordinator (PC) is bound by specific confidentiality clauses** detailed in the Consortium Agreement. If, for the progress of the project, a partner needs to transfer any not yet protected information to one or more other partner(s), the transferring partner may register this information by addressing it to the PC together with the identification of the receiving partner. In its acknowledgement, the PC appends a copy of the registered information with its signature on each page. The PC further informs the receiving partner(s) that it registered some information. By signing the consortium agreement, both transferring and receiving partner(s) recognise that the information registered by the PC will define the boundary of the information which has been transferred for the sake of executing the project.

Any unprotected information, which is not transferred by respecting the previous detailed steps, must be handled on a confidential basis by the receiving partner(s).

# 6 Conclusion

The fact of monitoring the activities of the NEMOSHIP project will make it possible to reach the objectives of communication fixed and thus to have precise elements to communicate at the end of the project. Furthermore, it will help the consortium to measure the impact of the project on the targeted audience. Through its ambitious dissemination, exploitation and communication plan, NEMOSHIP will help the whole European maritime industry to better understand what is at stake. The whole value chain will benefit from the lessons learnt of the project that will be shared openly. This shall lead to more competition in the industry, hence allowing to accelerate the maritime electrification.