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<b>Deliverable abstract</b>
<p>This deliverable aims at presenting how industrial partners could be involved in GROOM Research Infrastructure (GROOM RI) which is a key element of GROOM vision and mission statement. This report will thus contribute to the financial sustainability of the future RI.</p> <p>D3.3 will detail the following elements:</p> <ul style="list-style-type: none"> <li>• Methodology to identify industrials willingness to contribute to the financial sustainability of GROOM RI;</li> <li>• Existing and emerging sectors that the RI should target to ensure the involvement of industrials, whether it is through in-kind or financial contribution;</li> <li>• Ways industrials should be involved to maximise their level of participation.</li> </ul> <p>This report highlights that it is by pursuing and enhancing the association of key industrial players already interested in GROOM RI to the next steps of GROOM II project, that they will then be willing to financially support the creation of the structure.</p>

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## List of Abbreviations

AI	Artificial Intelligence
Argo	Scientific international programme for ocean observation using a fleet of robots
AUV	Autonomous Underwater Vehicle
BTCA	BlueTech Cluster Alliance
EC	European Commission
EIF	European Investment Fund
ENVRI	Environmental Research Infrastructures
EMSO	European Multidisciplinary Seafloor and water column Observatory
EOOS	European Ocean Observing System
EU	European Union
Euro-Argo	European contribution to the Argo Programme
ERIC	European Research Infrastructure Consortium
GOOS	Global Ocean Observing System
IAG-MAS	Industry Advisory Group for Marine Autonomous Systems
JERICO	Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability
MAS	Marine autonomous systems
MRI	Marine Research Infrastructure
MSC	Medium Sized Companies
PMM	Pôle Mer Méditerranée
R&D	Research & Development
RI	Research Infrastructure
SME	Small and Medium Enterprise
WP	Work Package

*Table 1 – List of abbreviations*

### DISCLAIMER

The contents of this publication are the sole responsibility of ARMINES, PMM-TVT and StratMar, and do not necessarily reflect the opinion of the European Union.

## 1. Background and context

Underwater and surface drones, in particular gliders, have become essential vehicles to carry scientific payloads for most environmental observations from the surface down to 6000 m and for activities supporting the blue economy. Their major advantages are being mobile, steerable, persistent and usable in large numbers and at relatively low costs. However, the distributed infrastructure required to exploit these assets must be able to meet different demands from research and monitoring of the marine environment to public service missions and industry needs, requiring customised payloads and operations. The rapid evolution of such technologies (robotics, artificial intelligence, sensors, big data) requires that the R&D resources offered by this distributed infrastructure continuously adapt to users' demands.

The complex hardware and information technology characteristics of such a distributed European infrastructure, optimizing access to resources and R&D for gliders, were analysed during the GROOM-FP7 design study from the perspective of research and the Global and (future) European Ocean Observing System (GOOS & EOOS) needs. Since then, several “gliderports” have developed which has fostered a corresponding European industrial innovative sector.

GROOM II, building on its predecessor, will deliver the decision basis for an advanced Marine Research Infrastructure (MRI) that promotes scientific excellence, fosters innovation, supports the blue economy, builds industrial and public partnerships, and works towards helping achieve the common research and innovation mission for future Europe. The project will define the overall organization of an infrastructure dedicated to ocean research and innovation, and maritime services supporting Blue Growth: GROOM RI.

This infrastructure will be a positive step against today's fragmented European MRI landscape, aiding connections, and synergies for the completion of GOOS and EOOS. Indeed, it has a facilitator role and thus aims at promoting the products & services offered by industrials, developing healthy collaborations between researchers and industrials.

### GROOM RI Vision:

Be the European Research Infrastructure harnessing the advantages of Marine Autonomous Systems (MAS) to provide high-quality ocean observation data and services for the benefit of society, enabling scientific excellence and moving towards net-zero activities.

### GROOM RI mission

This European Research Infrastructure integrates national infrastructures for Marine Autonomous Systems (MAS) to provide access to platforms and services to the broadest range of scientific and industrial users, as well as other ocean observing RIs. It maintains a unique centralized provision of cyber-infrastructure, data and knowledge for the optimized use of MAS to study climate and marine environments, and to support operational services and the blue economy.

## 2. Methodology

This part of the deliverable will present the methodology used by PMM-TVT and StratMar to identify industrials, collect and analyse their opinion on their potential future collaboration with and involvement within GROOM Research Infrastructure (GROOM RI).

### 2.1. A SURVEY TO COLLECT INDUSTRIALS' OPINION

The collection of key industrial players' point of views and visions on the financial sustainability of the future GROOM RI has been done through a survey published on *EUSurvey* and sent by email to key stakeholders. The questionnaire was disseminated from the 3<sup>rd</sup> of October to the 10<sup>th</sup> of November 2022. This section presents the way respondents were identified, how data protection was ensured and how the data collected were analysed.

#### 2.1.1. Target identification

The main target of the survey is European companies using and/or designing and manufacturing Marine Autonomous Systems (MAS) and their components whether directly or indirectly (using data for example).

They were identified thanks to the networks and knowledge of GROOM II partners. All partners have been asked to communicate the survey to any company using MAS and to encourage them to answer. This approach maximised the participation rate as GROOM II partners are well-established in the sector. The IAG-MAS (Industry Advisory Group for Marine Autonomous Systems) - a group of key stakeholders willing to participate in the GROOM RI preparatory phase - has also been prompted to complete the survey.

On top of that, the Blue Tech Cluster Alliance (BTCA) - of which Pôle Mer Méditerranée – Toulon Var Technologies (PMM-TVT) is a member - identified relevant stakeholders among its network to encourage them to complete the survey. This Alliance is a global network of industry-led blue technology clusters which aims at promoting “investment and growth of the knowledge-based ocean and water industries, to the mutual benefit of all parties, through active regional, national and international collaboration”. Taking advantage of the network of the BTCA broadened the scope of the potential respondents.

#### 2.1.2. Profile of the respondents

18 people from 6 European countries (Cyprus, France, Germany, Norway, United Kingdom and Spain) and 2 non-European countries (Canada and the USA) answered the questionnaire sent to a sixties of enterprises. It means that 33% of the recipients of the survey responded which is a good result for this type of survey.

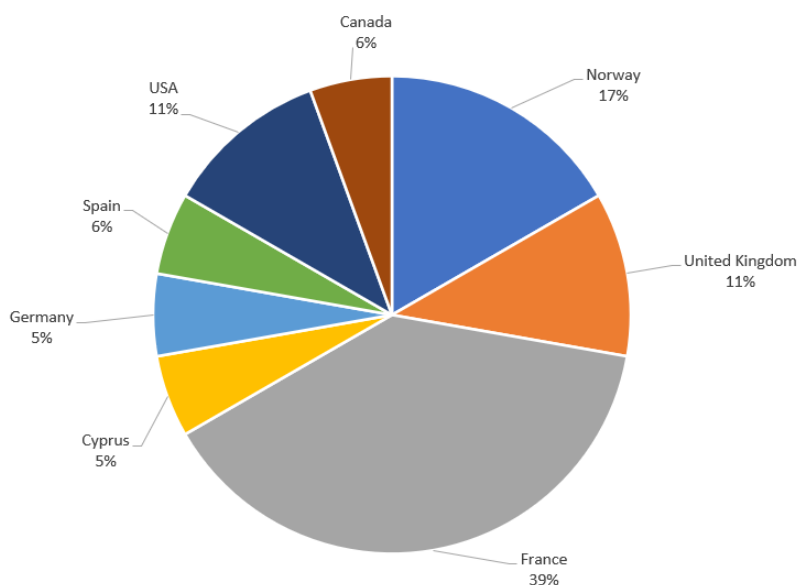


Figure 1 – Participation by country

Organisation	Country	Main activity
<b>Kongsberg Maritime</b>	Norway	It is a large Group, world leader in marine technology. With an extensive portfolio of innovative and integrated products and solutions, Kongsberg Maritime delivers efficiency, reliability, flexibility, and environmental sustainability to enhance the business of its customers.
<b>Offshore Sensing AS</b>	Norway	This SME designs and manufactures surface vessels propelled by wind and electronics powered by solar panels. It can carry a lot of observing oceanic sensors and covers long distances.
<b>RS Aqua ltd</b>	United Kingdom	This SME helps ocean scientists and engineers explore further and discover more by providing technologies and unparalleled expertise. They are active in all fields of blue economy and services proposed include use of autonomous submarine and surface vehicle, ROV and gliders.
<b>Sonardyne</b>	United Kingdom	It is a Medium-sized company (MSC) providing underwater technology and engineering services focusing on the following markets: oil & gas, defence, MRE, science. It is one of the world leaders in acoustic submarine instrumentation technology.
<b>Exail (ECA robotic)</b>	France	It is a MSC, resulting from the merger of ECA Robotic and iXblue. Exail is one of the world leaders in autonomous and remotely operated submarine or surface vehicles and solutions for smart navigation, photonics, and maritime autonomy
<b>Cyprus Subsea</b>	Cyprus	CSCS is a consulting and services SME, specialised in Marine robotics and autonomous systems and especially gliders.



<b>Alseamar</b>	France	It is a MSC who produces high-tech marine and submarine equipment and innovative services and provides naval, subsea and offshore services, engineering expertise for defence, energy and observing the marine environment market. It is the only genuine glider's manufacturer in Europe. It also proposes unmanned surface and subsurface vehicles.
<b>4H-Jena</b>	Germany	This engineering SME offers tailor-made measurement technology, one of its markets is dedicated to underwater marine applications.
<b>Subseatech</b>	France	This SME is specialised in the design, manufacturing and services of marine and underwater solutions for inspection and investigation. It develops a large range of small ROV and surface and submarine autonomous vehicles.
<b>Nortek AS</b>	Norway	This SME develops and produces scientific acoustic instruments (doppler effect) to measure physical parameters in the ocean such as water in motion.
<b>SubSeaSail LLC</b>	USA	This SME designs and manufactures Unmanned autonomous surface vessels.
<b>Naval Group</b>	France	This large Group is one of the world leaders in designing, building, and maintaining all types of naval combat ships as well as nuclear submarines and all types of surface ships, including flight carriers. They are leaders in designing and manufacturing high value command control systems for monitoring the complex equipment of the warships including their weapons' system. They develop and use autonomous surface and submarine vehicles.
<b>INNOVA oceanografia litoral SL</b>	Spain	This SME is specialised in study, analysis and environmental marine and coastal projects. They can also propose oceanographic services with a large base of autonomous vehicles from several suppliers.
<b>Sea Vorian</b>	France	This SME has two subsidiaries, Neotek dedicated to marine instrumentation and RTSYS to underwater acoustics and autonomous vehicles. Their markets are marine environment, defence and industry. They can sell their products or propose services.
<b>SeaTrac Systems, Inc.</b>	USA	This SME designs and develops uncrewed surface vehicles for persistent in-shore and open ocean missions. Their target markets are marine defence, environment, and energy.
<b>ABYSSA</b>	France	This SME is dedicated to deep-sea exploration and operates in the world's oceans, up to 6,000m depth. It is an engineering and service company who will define the best solution (surface vessel, AUV and sensors) to answer the needs of their customers.
<b>PREDICT</b>	France	This affiliate SME company of the large Group SNEF is specialised in high quality software for predictive maintenance and mission planning. They are using AI algorithms. They are also involved in data collection and analysis.

<p style="text-align: center;"><b>AML Oceanographic</b></p>	<p style="text-align: center;">Canada</p>	<p>This SME manufactures high performance oceanographic and hydrographic instrumentation as sondes to collect marine data such as conductivity, temperature, pressure, dissolved oxygen, ph.</p>
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*Table 2 – Profile of the respondents*

The panel is well representative with three large Groups (including Predict SME, affiliate of SNEF), three Medium-sized companies (MSC) and twelve SMEs.

We can roughly categorise them in three classes:

- **Designers and manufacturers of Marine Autonomous Systems** as AUV (Autonomous Underwater Vehicle, propelled or not like the glider), ROV (Remote Operated Vehicle) and USV (Unmanned Surface Vehicle). There are nine companies in this field: 2 Groups, 2 MSC et 5 SMEs. Most of them also propose services in addition of selling their products.
- **Designers and manufacturers of marine instrumentation and data software.** There are six companies in this field, 4 of them are SMEs, one MSC and one Group (SME affiliated). They are selling their products but can also propose engineering solutions and services associated to their skill.
- **Providers of marine services.** They can propose to their customers tailor made engineering solutions and operational services using Marine autonomous Systems. There are 4 companies, all SMEs in this case.

### *2.1.3. Data protection*

According to the General Data Protection Regulation (GDPR), respondents are transparently informed about how the data they are providing in the survey is collected and analysed.

The data collected through this survey is only used for the purposes of GROOM RI project. It has only been shared to GROOM RI project partners for the achievement of the tasks, that is: Association pour la Recherche et le Développement des Méthodes et Processus Industriels (ARMINES), Centre National de la Recherche Scientifique (CNRS), Helmholtz Zentrum für Ozeanforschung kiel (GEOMAR), Cyprus Subsea Consulting and Service (C.S.C.S. LIMITED), Universitetet i Bergen (UiB), National Oceanography Centre (NOC), Marine Institute (MI), Hellenic Centre for Marine Research (HCMR), Consorcio para el diseño, construcción, equipamiento y explotación de la Plataforma oceanica de canarias (PLOCAN), Pôle Mer Méditerranée (PMM), StratMar Conseil, Universidade do Porto (UPORTO), Ilmatieteen Laitos (FMI), Göteborgs Universitet (UGOT) and Ecorys Nederland BV (ECORYS).

### *2.1.4. Analysis of the survey*

The survey results are analysed in this deliverable and will also be used to contribute to the analysis of deliverable D5.2 - Ensuring continuous evolution of glider services.

The results of the survey have been completed by inputs from the Industry Advisory Group for Marine Autonomous Systems (IAG-MAS). This advisory group gathers 29 members and has been created as part of T5.4 – Support to innovation: how can GROOM RI help stakeholders to develop new products and applications of GROOM II project. This group consists of users or potential users of marine robotics, sensor & platform manufacturers, and research organisations. It aims at establishing strong relationships between industrial and scientific stakeholders from the European Union, developing a cooperative framework between researchers and MAS service providers and identifying priorities for innovation in developing new MAS products and applications. More information on the IAG-MAS is available in D5.2 – Ensuring continued evolution of glider services.

## 2.2. WHY SHOULD INDUSTRIALS ANSWER THE SURVEY?

### 2.2.1. Co-defining the future RI

By answering the survey and sharing their opinion, industrials participate in the definition of the GROOM RI - whether it be on the type of services that it will deliver, on the markets it will target or on its legal structure - and thus make sure the future RI is aligned accordingly.

They participate in the definition of high-impact services for new and emerging markets in the blue economy, environmental services for industries that benefit from marine robotic monitoring and key societal benefits of a sustainable marine research infrastructure on MAS.

The future GROOM RI intends to establish strong relationships between industrial and scientific stakeholders by sharing resources (infrastructures, vehicles, data, know-how) and creating new public-private collaborations. It is by knowing specifically what are the needs of industrials that GROOM II partners will be able to design the future RI accordingly.

The answers to the questionnaire participate to the definition of:

- Services;
- Positioning on markets that are relevant for the development of industrials' projects;
- Level of involvement industrials are willing to provide (from using the infrastructures and services to participating in the governance of the RI).

### 2.2.2. Content of the survey

The survey is entitled “Expectations from industrials regarding the future GROOM RI” and is available in annex 8.1. The survey is divided into three parts:

- Expectations and needs;
- Markets and positioning;
- Industrials' involvement in the RI.

#### **EXPECTATIONS AND NEEDS**

GROOM RI aims to provide efficient services to industrials. This part guides GROOM II consortium in understanding the expectations and needs of industrials regarding the services the RI could provide.

#### **MARKETS AND POSITIONING**

It is important for GROOM II consortium to understand how industrial partners interested in participating in GROOM RI are positioned and on which markets. Indeed, it will help the future RI to tailor its activities accordingly. Thus, it is also of high value for GROOM RI to know about emerging markets that industrials may be interested in in the future.

#### **INDUSTRIALS INVOLVEMENT IN THE RI**

This part allows to better understand how administrative decisions for the implementation of the GROOM RI could impact industrials. It also evaluates industrials' level of interest to take part in the RI. No commitment of any sort is implied by the answers given.

### 2.3. COLLECTING GOOD PRACTICES FROM OTHER RIs

To complete the inputs given by industrials, ECORYS led a survey targeting existing RIs or communities of RIs to learn from their experience regarding the involvement of the industry in research infrastructures. Information about the target and content of the survey is available in the section 5.3 – State of play of industry involvement in the marine domain RIs (2022).

### 3. Existing and emerging sectors that the RI should target

This section will analyse and summarise the feedback gathered among industrials regarding the existing and emerging sectors that the future Research Infrastructure should target. Both the questionnaire and IAG MAS workshop inputs are considered.

It is important to mention that the questionnaire contains multiple choice questions. It means that respondents were able to select several answers to the same question and that the sum of the response percentage for each item, compared to the number of companies that responded, can be higher than 100%.

#### 3.1. HOW ARE INDUSTRIALS POSITIONED?

Questions 2.1 and 2.2 are particularly relevant to analyse the positioning of industrials.

Question 2.1 allows to analyse the current market positioning of MAS European industrials.

In which market(s) are you currently positioned?

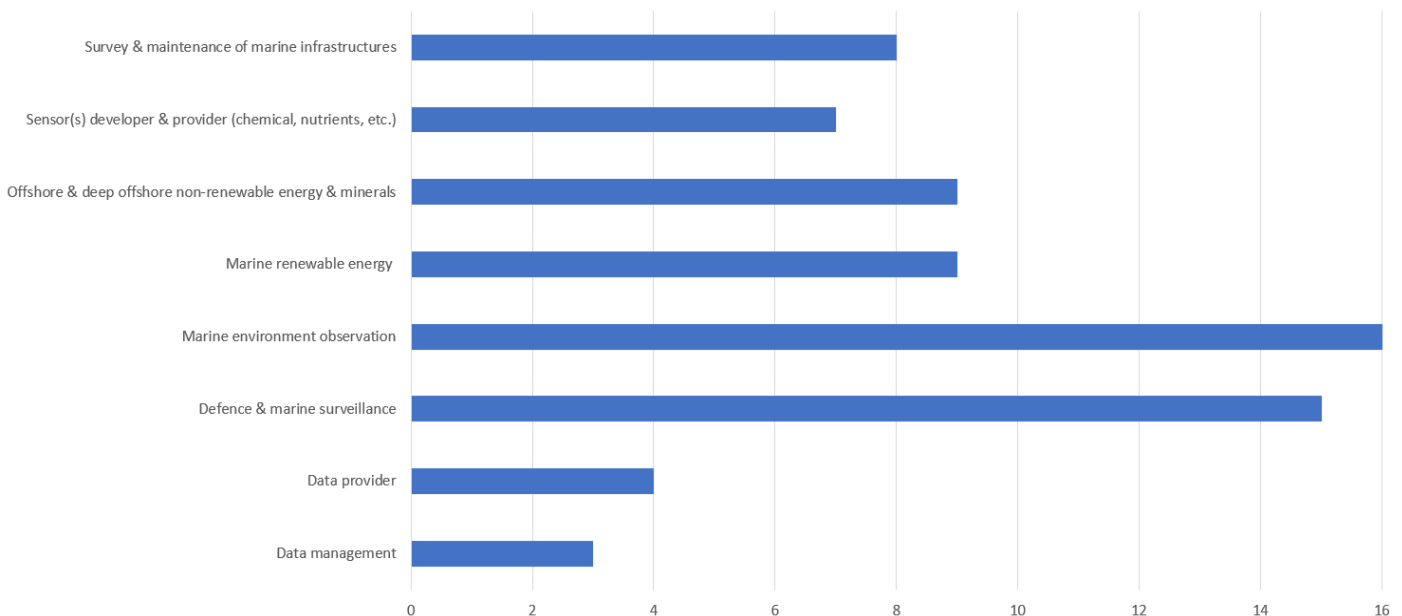


Figure 2 – Question 2.1 In which market(s) are you currently positioned?

The respondents mostly **plebiscite two** out of the eight markets suggested in the questionnaire:

- **Marine environment observation (88%);**
- **Defence & marine surveillance (83%).**

Additionally, three markets collected between **one third and half** of the votes, presented below in order of importance:

- Marine renewable energy and offshore and deep offshore non-renewable energy & minerals (50 % each);
- Survey & maintenance for marine infrastructures (44 %);
- Sensors developers & providers (chemical, nutrients, etc.) (39 %).

The last two markets proposed (“data provider” and “data management”) collected less than a fifth of the answers. These results, as explained before, could be tempered by the profile of the answering companies.

Question 2.2 interrogated industrials on the 3-priority technological emerging sectors they target for their industry.

Of these emerging sectors, what are the 3 technological priorities for your industry?

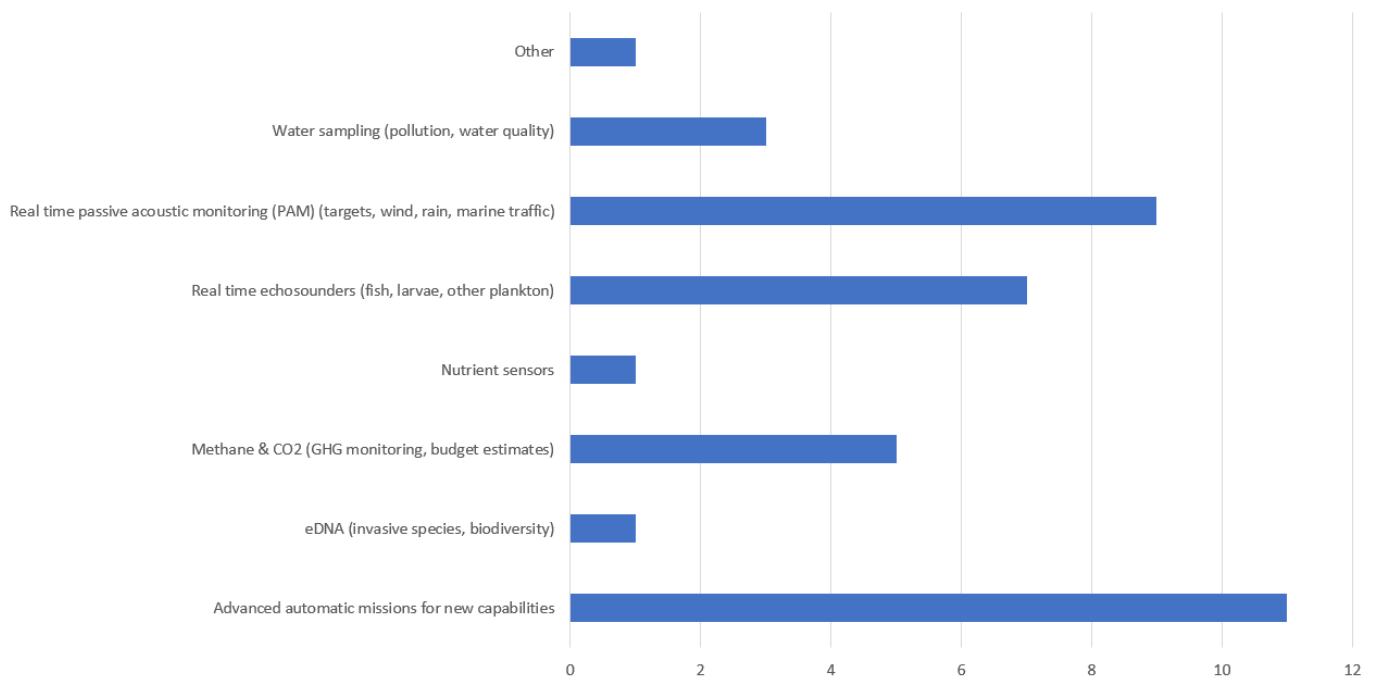


Figure 3 – Question 2.2 Of these emerging sectors, what are the 3 technological priorities for your industry?

Seven emerging sectors were listed in the questionnaire with the possibility to add others. Again, two sectors got more than 50 % of interest from the industrials:

- **Advanced automatic mission for new capabilities (61%);**
- **Real time passive acoustic monitoring (50%).**

Two other sectors aroused interest but only with approximately one third of the votes:

- **Real time echosounders (38%);**
- **Methane & CO<sub>2</sub> (28 %).**

It appears that all the other sectors have a very weak interest for industrials. Three of them obtained 5% of votes and for the other one 17%. It means only one company has chosen these sectors as a priority (it was: eDNA, nutrient sensors and another non mentioned by the company) and three for the technological sector water sampling.

**In conclusion**, we can retain from the analysis that the three priority markets for industrials are:

- **Marine environment observation;**
- **Defence & marine surveillance;**
- **Marine resources (renewable energy, Offshore and deep offshore non-renewable energy & minerals).**

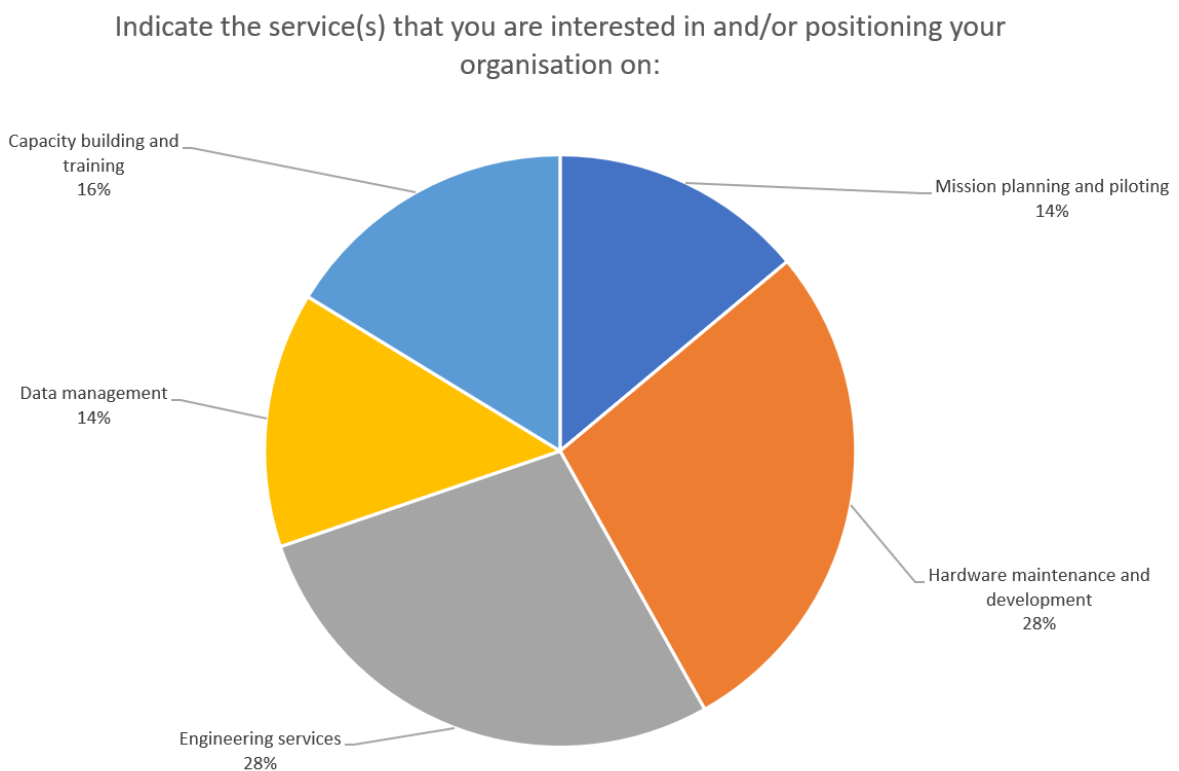
We have gathered as one the two markets linked to marine energy (renewable and non-renewable). It would also be relevant to include the survey & maintenance for marine infrastructures.

On the technological side in relation to these markets, the main priorities are:

- **Piloting of MAS in terms of advanced automatic mission for new capabilities involving advanced software with AI for example;**
- **Passive and active real time acoustic sensors and monitoring;**
- **Measures and monitoring of carbon molecules (methane, CO<sub>2</sub> ....).**

It means that to answer the current positioning of the industrials who participated in the survey, the RI should consider these markets and their associated technologies in the R&D development's goals of the RI. With the military applications representing a significant part of potential interactions with industrials, the future GROOM RI will need to define its positioning in terms of ethics.

### 3.2. INDUSTRY EXPECTATIONS REGARDING THE POSITIONING OF THE RI



This section analyses questions 1.1 and 2.3 to collect industrials' expectations regarding the positioning of the future GROOM RI. From [question 1.1](#) – Indicate the service that you would be interested in positioning your organisation on

*Figure 4 – Question 1.1 Indicate the service(s) that you are interested in and/or positioning your organisation on*

We can note that most of the companies (56%) are focused on “engineering services” and “hardware maintenance and development” reaching almost one third for each. The remaining 43% are equally shared among three services: data management, capacity building and training, mission planning and piloting, up to a sixth each.

[Question 2.3](#) explores the technologies/products or services that industrials could offer to GROOM RI.

The following table showcases the results:

	Sea Vorian	NAVAL GROUP	ALSEA MAR	PREDICT	Cyprus Subsea	Exail	-4H-Jena engineering	ABYSSA	AML Oceanographic	Nortek AS	Sub SeaSail LLC	Kongsberg Maritime AS	INNOVA	SeaTrac Systems Inc.	Offshore sensing	Sonardyne	SUBSEA TECH	RS Aqua Ltd	TOTAL
Buoyancy	X										X		X						3
Data collection	X		X	X	X	X		X			X	X	X	X	X	X	X		13
Embedded energy											X		X				X		3
Mine clearance	X	X				X						X	X			X			6
On-board intelligent command control	X	X		X				X			X			X			X		7
Provide decision support		X	X	X	X	X		X						X		X		X	9
Underwater communication	X		X					X			X	X	X	X		X		X	9
Acoustic sensors	X		X		X			X	X	X	X	X	X			X	X	X	12
Autonomous Underwater Vehicle	X		X		X	X			X			X	X					X	8
Positioning system	X					X						X	X	X		X			6
Radio Communication & satellite communication					X						X	X	X	X				X	6
Remotely Operated Vehicle (ROV)					X	X							X				X	X	5
Surface uncrewed vehicle						X					X	X		X	X		X		6
Underwater glider			X		X								X						3
AUV (including gliders) services	X		X		X			X			X	X	X					X	8
Data report	X		X	X	X			X											5
Surface drone services						X								X	X		X		4
Training			X		X								X	X	X	X	X		7

Table 3 – Products and services that industrials are willing to make available for GROOM RI



From the eighteen companies who answered the questionnaire, **thirteen offer technologies, products, and services, all together**. One of them does not offer anything.

**On the technological side**, 72 % (13) of the companies offer data collection and half of them decision support and underwater communication (essentially acoustic). Seven of them (39%) offer on-board intelligent command control which is essential for efficient MAS. Few of them offer specific technologies such as embedded energy and buoyancy that can be however useful for the RI. The SMEs subsea sail and Innova are offering both.

It is interesting to mention that out of the 7 proposed technologies:

- Seavorian and SubSeaSail offer five technologies (i.e 71 %);
- Innova, Abyssa, Seatrac systems and Subseatech offer four technologies (i.e 57 %);
- Alseamar, Exail, Kongsberg and Sonardyne offer 3 technologies (i.e 43%).

**All these companies should be contacted on priority by the governance of GROOM II project.**

**When it comes to offering products**, acoustic sensors (66%) and autonomous underwater vehicles (44%) are the products most often available.

Out of the seven products listed:

- Kongsberg and Cyprus propose five products;
- Exail and RS Aqua propose four products (more service operation than selling equipment).

It is interesting to mention that all the suppliers of autonomous vehicles, except from Exail, are also suppliers of acoustic systems and 66 % of them are also suppliers of positioning systems or radio & satellite communication systems. In fact, companies designing, and manufacturing autonomous vehicles are also involved in design and manufacturing of essential equipment to operate MAS.

Only three companies are proposing gliders (that are also underwater vehicles): Alseamar, Cyprus and Innova. **These companies represent highly interesting targets for GROOM RI.**

**Regarding the services offered**, fourteen companies are willing to be involved.

Out of the four services suggested:

- Four companies propose three services: Innova, Alseamar, Subseatech and Cyprus
- Four companies propose two services: Seavorian, Abyssa, Seatrac and offshore sensing.

AUV services (44 %) and training (39%) are most often mentioned by the industrials.

An emerging service using surface autonomous vehicles is proposed by four companies - Exail, Seatrac systems, Offshore sensing and Subseatech - and could be of **great interest for Groom RI because of its differentiating factor**.

As a conclusion, considering the positioning and offer of the industrial companies interested in the project, GROOM RI should prioritise the integration of engineering services and development of hardware equipment and their maintenance.

About the offer of companies, the main outputs are:

- On data collection (technology) and report (service);
- All domains related to acoustic sensors, communication as well as underwater radio and satellite;

- Development and use of smart command control for MAS as automatic piloting, decision support, on board and real time computing etc.;
- Development of autonomous surface and underwater vehicles (including gliders) and services associated.

It is highly important for the future of Groom RI to note that **the seventeen companies who are ready to offer their technologies, products, or services to Groom RI are well known and very competent in their field of activity.**

## 4. How could industrials contribute to and profit from the RI?

This section analyses and summarises the feedback gathered among industrials regarding the potential contribution that they could make to and profit they could get from the future GROOM RI. Both the questionnaire and IAG MAS workshops inputs are considered.

### 4.1. EXPECTATIONS FROM INDUSTRIALS REGARDING THE FUTURE RI

Questions 1.2, 1.3, 1.4 and 1.5 were analysed to understand what industrials' expectations are regarding the future RI.

The first interest for the industrials (question 1.2) concerns the promotion and development of sales and markets of the companies. The items "Showcasing your products and/or services" and "finding new prospects & clients" got respectively 31% and 27% of the answers. The second priority for the industrials are "participation in scientific studies" (19%) and "International awareness" for 13%. The two other potential contributions which could be brought by the RI - "scientific competitiveness" and "competitive intelligence" - present poor, or even no interest for industrials.

Regarding the capacity of the RI to promote companies (question 1.3), the answers are equally divided between the four propositions which were "dissemination to scientific experts, researchers and industrial actors" with 30%, "online visibility social medias & website" with 26%, "catalogues of services" and "conferences" with 22% each.

When it comes to their expectations regarding the cooperation with other industries of the RI (question 1.4), more than two third of the industrials wish to develop their network and high-quality services with other participants of the RI. They are almost not interested in sharing resources and costs (missions, projects, communication etc.). It represents only 18% and 13 % of answers.

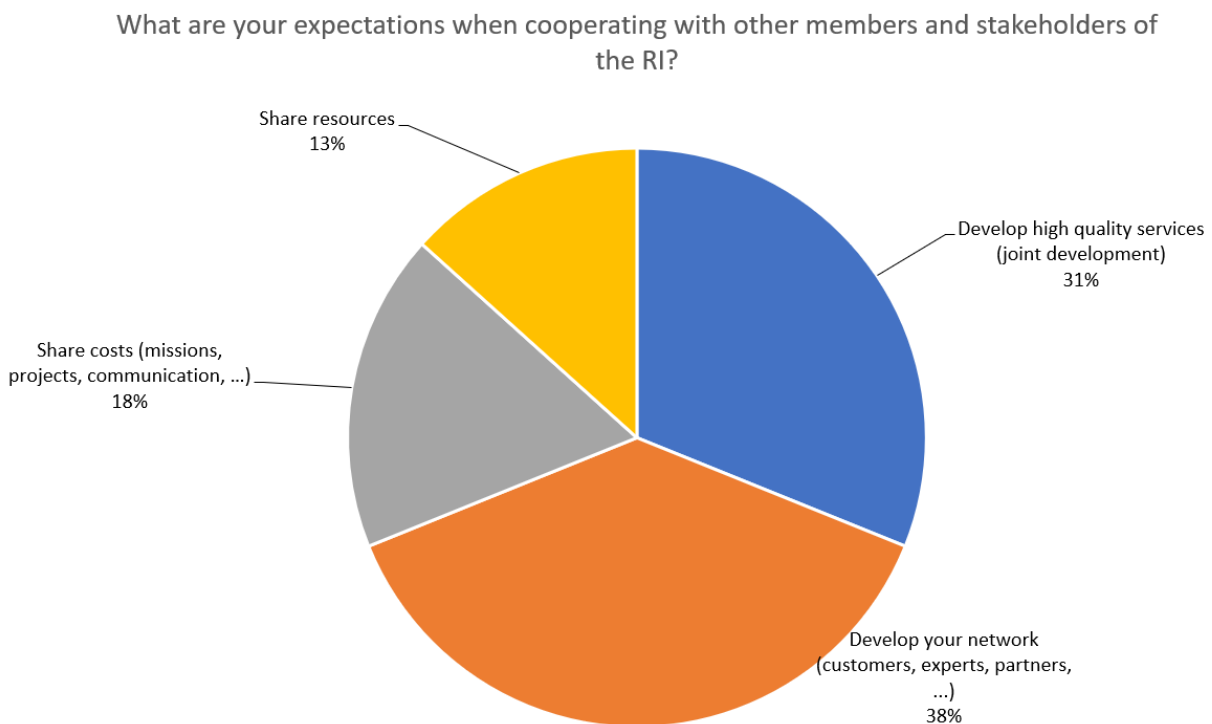


Figure 5 – Question 1.4 What are your expectations when cooperating with other members and stakeholders of the RI?

To further develop the analysis of industrials' expectations, the respondents expressed their opinion on the measures that should be taken to guarantee a healthy collaboration between them and the future RI (question 1.5). This question aims to further understand how GROOM RI should cooperate with industrials, considering that the future RI would have a facilitator role. The validation of disseminated information is considered as the most important condition for a healthy collaboration. They also wish that a specific agreement for cooperation were concluded for each programme. A minority of them considered access to software and/or hardware as an issue.

In conclusion for industrials, **the RI could help them to promote their technologies and products through scientific dissemination, showcasing and conferences.** The RI will allow them to reach new markets or reinforce them on their existing markets. Cooperation between them and scientists to develop new projects or contribute to propose high quality services through the extent of their network is expected. For that, it will be important that the RI propose a legal framework which facilitates cooperation.

#### 4.2. INDUSTRIALS ACTIVE CONTRIBUTIONS

After analysing industrials' expectations, we will now analyse how they would like to contribute. To do so, questions 3.1, 3.2, 3.3, 3.5 and 3.6 are considered.

To the question "would you be interested in being part of GROOM RI?" (3.1) 90% of the respondents answered that they are potentially interested. It means that the 10% who answered "no", did not answer the rest of the questions in this part and are taken into account as answering "no" to others.

To facilitate the integration and involvement of industrials in the future RI, it is important to be aware of their motivation to do so. Question 3.3 showed that the motivation of three quarters of respondents is cooperation and networking. They are mainly interested in getting access to a network of professionals and scientists and in cooperating with them. It is thus crucial to make sure that the future RI will facilitate and foster cooperation and networking.

What are your main motivations to participate in GROOM RI?

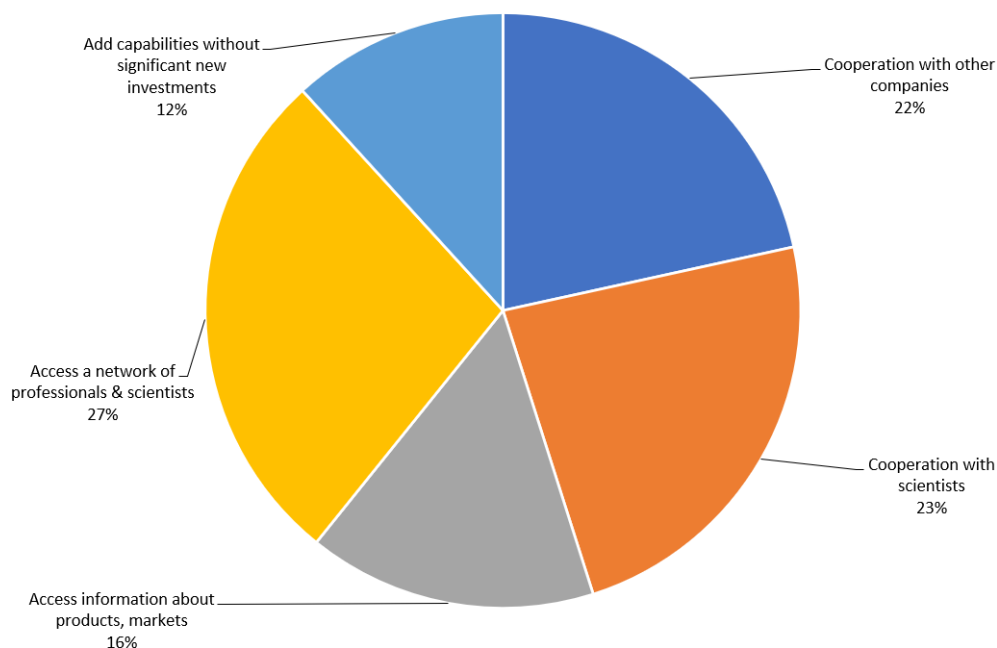


Figure 6 – Question 3.3 What are your main motivations to participate in GROOM RI?

From question 3.2, it appears that 22% (i.e. 4) of the respondents do not want to be involved in the governance of the RI. The remaining are equally distributed between those who want to play an active role (i.e. 7) as advisor and the others (i.e. 7) who do not know at this early stage if they will commit to play an active role or not.

When it comes to making resources available for the RI (question 3.4), 72% of the companies do not know if they will make in-kind contributions in the future RI. In fact, there is a lack of information about the objectives and potential return on investments of the RI which prevents companies from projecting. However, two companies are ready to make software and human resources available for GROOM RI: Predict for software and 4H Jena engineering for software and human resources.

Regarding financial contribution from industrials (question 3.5), only RS Aqua Ltd company is ready to pay for a membership. 44% of the answers are negative and **50% are conditionally ready to pay for a membership or to make in-kind contributions in the form of hardware, software or human resources.** For the two questions above, the main conditions they express to contribute financially or with in-kind contributions are:

- Increase of their turn over;
- Access to facilities (if possible South of France), and open the possibility to conduct major experiments and demonstrations, as part of cooperation such as European projects (Aseamar);
- Amount of the fees and type of partnership they can develop next to
- Value proposal and benefit brought by the RI (not clear currently for industrials)

For question 3.6, are you already involved in another research infrastructure? All the respondents have answered “no”. It seems that next to the benchmark of existing RI or assimilates, very few companies are involved in. It is a recurring issue that RI has to deal with. It could be strongly connected to the legal form of the RI. However, inside the IAG MAS a couple of members are part of a RI. The interest aroused by GROOM II could change this situation.

In conclusion, it appears that industrials express a real interest to be part of the RI, especially for networking and cooperation purposes. It is thus crucial for the RI to include this as part of its daily activities to ensure its cooperation with industry. However, it also appears that industrials need clear and detailed information about the potential return on investments that they could benefit from the future RI to accept further involvement (by being part of the governance of the RI, or by providing in-kind contributions or paying fees).

Most companies answering to the questionnaire are positive for the creation of a RI focusing on MAS. It is a little bit early to confirm the level of their implication, especially in terms of financial contribution (funding or in-kind) as they would need more detailed information for such commitment, however they do express an interest to contribute and are not against future contributions.

Their expectations with regards to the future RI are mainly

- To promote and showcase their technologies, products, and services with scientific support
- To help to increase their turnover by aiming new markets;
- To improve their technology skills, their products and services through cooperation,
- To access facilities for testing and qualify their products (autonomous platforms and payloads) networking, and projects with a secure legal framework agreement;

## 5. Existing RIs and their relationship with industry

### 5.1. INTRODUCTION

The previous chapter showed ample evidence of industry’s anticipated interest and participation in GROOM RI services and activities. However, it became also apparent that none of the interviewed industries is presently actively involved in any operational RI in the marine domain.

In this chapter we will research the current industry involvement in RI from the RI viewpoint, to find out about the current state of affairs and to seek learning experiences that will support the GROOM RI with financial sustainability of industry.

### 5.2. RI INNOVATION AND INDUSTRY LIAISON PREPAREDNESS ROADMAP PREPARED BY ENVRI

ENVRIplus is a Horizon 2020 project bringing together Environmental and Earth System Research Infrastructures (RIs), projects and networks with technical specialist partners to create a more coherent, interdisciplinary, and interoperable cluster of Environmental Research Infrastructures across Europe. The Research Infrastructures participating in ENVRI in the marine domain include (among others) EMSO, Euro-Argo, EUROGOOS, EUROFLEETS+, JERICO and GROOM RI.

ENVRIplus aligns its activities to a core strategic plan where sharing multi-disciplinary expertise will yield maximum social-economic impact. Obviously, this includes policymakers and industry partners next to scientists.

Part of ENVRIplus is therefore dedicated to developing a roadmap for the ENVRIplus community to engage actively with industrial partners to create more sustainable partnerships. The following paragraph summarises the key findings of the document ‘RI INNOVATION AND INDUSTRY LIAISON PREPAREDNESS ROADMAP’ prepared by ENVRI.

#### 5.2.1. *Types of potential industry targets Research Infrastructures should seek*

**1. “Industry Association and Interest Group “Aggregators”**. PanEU and national industry federations and associations, as well as environmental lobby and interest groups that actively follow and advise on environmental issues and technology developments on behalf of private sector members and stakeholders. Such organisations usually have strong sectoral focus and expertise and can be valuable partners in helping pre-qualify and recruit RI company interlocutors and focused brokerage events participants.

**2. Industrial suppliers – the “Upstream Model”**. The permanent race for the best valuable investment forces RI managers to seek industrial suppliers of unique components and services at the cutting-edge of technological possibilities. In the construction and major upgrade stages of RIs – design, engineering, commissioning – industry acts mainly as a provider of state-of-the-art technologies, new designs, components, software, under standard procurement conditions or in closer collaborative conditions.

**3. Intermediary “midstream” SMEs**. A large group of potential RI industry partners is constituted by intermediary ICT companies such as data SMEs active in enabling and enhancing key aspects of the digital transformation and big data revolution. These companies are natural allies of RIs in building open data access, big data management, ensuring interoperability, and adoption of the FAIR principles by RIs that promote findability, accessibility, interoperability, and reuse of data.

4. “Downstream” environmental monitoring market SME applications developers, integrators, and services providers. Satellites, in-situ data acquisition systems such as Research Infrastructures and finally also citizens are delivering huge quantities of complementary environmental data. Technological capabilities such as machine learning, artificial intelligence, and cloud computing improve the ability to extract market intelligence.



Source: “The challenge for geo-spatial service providers in the Digital Economy”  
 Mónica Miguel-Lago: EARSC Executive Secretary  
 Presentation at ENVRIplus First RI Industry Partnering Forum – Grenoble May 2017

Figure 7 - Overview of potential Earth Observation services

### 5.2.2. State of play industry involvement in ENVRI (2019)

A survey of the websites of a sample of ESFRI environmental research infrastructures (8 LANDMARKS and 2 PROJECTS chosen at random) conducted in the Spring of 2019 confirmed that most RIs provide very little information specifically geared to educate or attract potential private sector users and prospective innovation partners. In a nutshell, the survey showed that ENVRI have little or no public persona when it comes to the pursuit of innovation cooperation with industry and place very little effort and emphasis on developing cohesive RIs’ innovation strategies and implementation programs. Despite the fact that all or most have fruitful relationships with companies of one kind or another, primarily at the node level with suppliers and users, few if any have developed any kind of organised or systematised approach to nurturing and building on these industry linkages to produce results that can constitute public Innovation Success Stories for the RI and for ESFRI as a whole.

### 5.2.3. *RI Innovation and industry liaison preparedness roadmap*

The RI Innovation and industry liaison preparedness roadmap developed by ENVRI put forward a number of recommendations which are essential in changing this situation, at two levels:

#### At the pan EU level:

1. Establish centralised RI Innovation Services Hub-and-spoke configurations able to develop and offer pan-RI innovation know-how and services. Ideally, the Innovation Hub Service and Innovation Communications function should be centralised in ESFRI or the BEERi or some equivalent pan-ENVRI umbrella organisation able to provide overview visibility and reach.
2. Develop and establish a structured RI Industry Liaison Officer network, to support and accelerate the implementation of the ENVRI ILO network recruiting RI staff (see action 4 below) with the required background and skills to liaise successfully with private companies and communicate effectively about and with industry in a hub-and-spoke collaboration setup with the Hub. This recommendation is currently addressed in the ENRIITC project.

#### **ENRIITC**

The ENRIITC project aims to build a permanent pan-European network of Industrial Liaison and Contact Officers (ILOs and ICOs) and enable industry to become a full partner of research infrastructures whether it is as a user, a supplier, or a co-creator. In other words, ENRIITC supports the establishment of strategic, cross-border partnerships between industry and research infrastructures. The primary objectives of ENRIITC are:

- Establish a sustainable European network of ILOs and ICOs which enables mutual learning;
- Map collaboration potential between research infrastructures and industry;
- Develop and refine strategies and best practices to foster these collaborations;
- Raise awareness among industry for collaboration opportunities at research infrastructures and demonstrate impact.

ENRIITC brings together 11 Partners and more than 60 Associates from around Europe. The network members represent diverse scientific areas, industrial sectors, and geographical regions. ENRIITC is inclusive and welcomes new members.

The project kicked off in January 2020 and will conclude in December 2022. The budget to implement the ENRIITC concept is 1.5M EUR.

3. Explore building a strategic alliance relationship between the central ENVRI Innovation Hub and the European Institute of Innovation and Technologies (EIT, <https://eit.europa.eu>) Knowledge & Innovation Communities (KICS) for cooperation on joint Entrepreneurship Training programs and Industry-partnering events recruitment.

#### At the individual RI level:

The roadmap proposes 13 key recommendations ENVRI need to put in place in order to establish a common baseline for developing systematic innovation-partnering industry-liaison programs.



- 14 RI “INNOVATION-READINESS” ACTION-PLAN RECOMMENDATIONS**
1. Introduce “Innovation Cooperation with Industry” as a priority in every ENVRI’s Annual Strategic Plan
  2. Ensure that its website homepage has a high-level “Industry” or “Innovation” menu tab and section
  3. Prepare an annual Innovation and Industry-Liaison Strategy as an annex to the RI Business Plan
  4. Hire a full-time Innovation/Industry Liaison officer(s) (see competencies recommendations below)
  5. Hire a Communications Officer(s) with commercial experience
  6. Set a target for how much cooperation with Industry should ideally contribute to RI annual revenues (%)
  7. Establish a multi-disciplinary, gender-balanced, Industry Advisory Committee
  8. Highlight four Industry-cooperation Success Stories on its website and in annual reports to the EC and ESFRI
  9. Make sure its Data Portal offers users open, user-friendly access to RI data and services
  10. Publish an online RI Services Catalog, inclusive of specific services/opportunities for/with industry
  11. On its website, make readily available a standard R Service-level Agreement and IP Policy Guideline for SMEs interested in licensing RI data to (co-)develop value-added products and applications
  12. Establish an annual Training Action Plan and Program as annexes to the Business Plan in consultation with industry to bring together RI researchers and company engineers and managers
  13. Develop an RI Talent-Attraction Exchange Program with industry to train the next generation of young scientists and engineers;

*Figure 8 – 14 RI “Innovation readiness” action-plan recommendations*

### 5.3. STATE OF PLAY INDUSTRY INVOLVEMENT IN THE MARINE DOMAIN RIs (2022)

It is now the end of 2022. Let us take a look (again) at a number of RIs in the marine/MAS domain – and how industries are involved. For this benchmark we selected the following RIs.

PROJECT/ ACRONYM	Active since	Status/type of RI	ESFRI roadmap	Short description
JERICO	2011 (H2020)	Working on a long-term vision and towards ERIC	Not included	<p>JERICO-RI is an integrated pan-European multidisciplinary and multi-platform research infrastructure dedicated to a holistic appraisal of coastal marine system changes. JERICO-RI establishes the framework upon which coastal marine systems are observed, analysed, understood and forecasted.</p> <p>JERICO-RI enables open-access to state-of-the-art and innovative facilities, resources, FAIR data and fit-for-purpose services, fostering international science collaboration.</p> <p><b>Private sector, technology providers and service providers</b> are explicitly mentioned as target groups next to environment agencies.</p>
Euro-Argo	2008	Operational RI (ERIC) since 2014	Landmark	<p>The Argo network is a global array of more than 3500 autonomous instruments, deployed over the world ocean, reporting subsurface ocean properties to a wide range of users via satellite transmission links to data centres.</p> <p>In that framework, 12 European countries gathered in 2008 within the <u>Euro-Argo project</u> with a common aim to provide an optimized and sustained European contribution to Argo by deploying 250 floats per year.</p> <p>After a 3-year successful preparatory phase, the Euro-Argo <u>European Research Infrastructure Consortium (ERIC)</u> was established in 2014 and is now able to take up this challenge by responding also to specific European interests for marginal seas, high latitudes, biogeochemical measurements and depths greater than 2000m.</p>

EMSO	<2006	Operational RI (ERIC) since 2016	Landmark	EMSO has been a European Research Infrastructure Consortium (ERIC) since 2016. EMSO ERIC consists of a system of regional facilities that includes open-ocean, seafloor observatories down to 4,850 metres depth, and shallow-water test sites placed at key sites around Europe, from Northeast to the Atlantic, across the Mediterranean, to the Black Sea. Observatories are platforms equipped with multiple sensors, placed along the water column and on the seafloor. They constantly measure different biogeochemical and physical parameters that address natural hazards, climate change and marine ecosystems. Currently, EMSO ERIC brings together 15 Regional Facilities, among which three are test sites, offered by 28 research centres located in nine European countries. EMSO offers high-quality environmental data and services covering a multi- and interdisciplinary range of research areas including biology, geology, chemistry, physics, engineering and computer science, from polar to tropical environments.
EUROFLEETS+	Feb 2019 (H2020)	Working towards AISBL	Not included	<p>EUROFLEETS+ is an H2020 project funded under the Infrastructures initiative, coordinated by the <a href="#">Marine Institute</a> that brings together a significant group of key marine research actors (in particular research vessel operators) in Europe, North America and Oceania – 42 marine institutes, universities, foundations and <b>SMEs</b> from 24 countries (<a href="#">full list</a>).</p> <p>The EUROFLEETS+ project will facilitate open free of charge access to an integrated and advanced research vessel fleet, designed to meet the evolving and challenging needs of the user community. European and international researchers from academia and industry will be able to apply for several access programmes, through a single-entry system. EUROFLEETS+ will prioritise support for research on sustainable, clean and healthy oceans, linking with existing ocean observation infrastructures, and it will support innovation through working closely with industry.</p>

*Table 4 – RIs selected for the benchmark*

To find out about industry involvement the following research methods have been applied:

- Interviews with the project coordinators of the selected projects. Unfortunately, only EURO-ARGO and EMSO have replied;
- Analysis of the various websites;
- Analysis of the presentations by the selected project with regard to their legal status.

#### **Very limited industry involvement in EURO-ARGO RI**

First of all, it becomes clear that the operational RI Euro-Argo, is (almost) entirely driven by the scientific community.

- Industry is sometimes included in technological developments. This happens mostly, if not exclusively, via EU-funded projects;
- Otherwise, industry is involved as supplier of technologies, floats and sensors under standard procurement conditions;
- Funding is provided by the regional facilities and participating countries;
- Industrial users of the RI are more or less absent (Euro-Argo: Euro Argo ERIC has no direct link to potential industrial users or possibility to develop services for industry. This reduces interactions with industry to the role of commercial supplier. Industrial involvement contributing to the sustainability of Euro-Argo ERIC operations is excluded, even at a minimal level).

#### **Some industry involvement in EMSO**

Operational RI EMSO indicates that as an infrastructure with an important technological component, the industry is a key partner and that they are committed to developing a permanent collaborative framework to deal with the industry on a daily basis. Training, physical, remote and virtual access, and co-development in Horizon Europe projects or on a structural basis are the three pillars on which the cooperation with the industry is organised in EMSO ERIC. Additionally, EMSO is one of the main actors in developing a European Strategy for improving the relationships between EU RIs and the Industry.

### **5.4. CONCLUSION**

In short, the well-established operational RIs (Euro-Argo, EMSO) that are being considered in this chapter are firmly embedded in the scientific community. Industries are only involved as suppliers, industry users and funding is not existing, nor fervently aspired.

Upcoming RIs like JERICO and Eurofleets+ however, are (more) keen on involving industry players as users, but still working on how to attract industry users and turn industrial use into actual funding by industrial parties. In other words, the existing projects/RIs that are close to GROOM in the RI landscape do not offer much guidance on how to achieve financial sustainability with industry.

It should be noted though that the 13 key recommendations ENVRI need to put in place to establish a common baseline for developing systematic innovation-partnering industry-liaison programs could be very helpful.

## 6. Fostering links with other organisations: the example of Blue Invest

### 6.1. BLUE INVEST: BOOSTING INNOVATION AND INVESTMENT FOR A GREEN BLUE ECONOMY

BlueInvest is a platform and accelerator to foster innovation and investment in sustainable technologies for the blue economy. It supports growth, economic development, and investment readiness of SMEs in the Blue Economy.

“BlueInvest aims to boost innovation and investment in sustainable technologies for the blue economy, by supporting readiness and access to finance for early-stage businesses, SMEs, and scale-ups. It is enabled by the European Maritime and Fisheries Fund.”

After a first successful phase (200 SMEs that have received investment readiness support; more than €100 million public EU funds allocated that will enable private actors to invest up to €300 million), the European Commission announced its continuation until 2026.

The EIF BlueInvest Fund in its pilot version will be replaced by the **InvestEU** Fund, which aims to mobilise more than €372 billion of public and private investment through an EU budget guarantee of €26.2 billion that backs the investment of implementing partners such as the European Investment Bank (EIB) Group and other financial institutions.

### 6.2. BLUEINVEST: AN OPPORTUNITY FOR GROOM RI INDUSTRIAL USERS

This platform is an opportunity for SMEs to:

- Be part of a community fostering networking (Euroquity) between potential partners and investors and facilitating access to exclusive information on markets and upcoming business opportunities.
- Benefit from the Investment Readiness Assistance programme targeted to high potential start-ups and SMEs with innovative and sustainable products and solutions for the Blue Economy. The selected beneficiaries will receive feedback on their investment readiness level, benefit from coaching services (one-to-one coaching sessions over 3 months) and participate in exclusive networking and B2B matchmaking sessions. A new initiative, the Tailored Fundraising Assistance will be added to the existing services. It will provide advisory services to secure private equity and venture capital finance by investors and investment-readiness experts.
- Be part of the BlueInvest Project Pipeline gathering relevant projects and companies in the Blue Economy that are either receiving assistance from BlueInvest or identified as having high potential to develop innovative technologies. It is a great opportunity for SMEs to display themselves to investors.
- Benefit from BlueInvest Grants (EMFF - European Maritime and Fisheries Fund): Blue Window Call for proposals are published regularly to help advance market-readiness of new products, services, or processes in the Blue Economy.
- Benefit from BlueInvest Fund (European Investment Fund), structured as an EFSI (European Fund for Strategic Investment) Equity Product to provide finance to funds that are targeting the blue economy.

### 6.3. LINKS TO BE CREATED BETWEEN GROOM RI AND BLUEINVEST

A meeting was held Wednesday 23 November 2022 from 5.30pm-6.30pm between the following participants:

Name	Surname	Organisation	Position
AUREGAN	Charlène	Pôle Mer Méditerranée	EU project manager
BOURILLON	Chloé	Pôle Mer Méditerranée	EU project manager
FRIDERES	Catherine	Blue Invest	Blue Invest project manager
MARTINELLE	Agnes	Blue Invest	Blue invest community officer
RUEL	Colin	Pôle Mer Méditerranée	EU project department director

*Table 5– BlueInvest meeting attendance list*

As part of the meeting, Pôle Mer Méditerranée made a presentation of the GROOM II project and potential benefits BlueInvest could have by collaborating with the future RI. A few examples of mutual interests were suggested:

- Visibility for BlueInvest opportunities and for GROOM RI services;
- Projects supported through GROOM RI can have an interest for BlueInvest;
- Projects supported through BlueInvest mechanisms can have an interest for GROOM RI.

This presentation led to discussions on how blue invest could be interested in creating links with GROOM II and with the future GROOM RI. Indeed, there is a new regulation on ocean observation that is leading to higher interest from investors on ocean observation technologies and is leading to market movement as well. According to BlueInvest representatives, it would be interesting for GROOM II to present the project and future RI to the Blue Invest community and more specifically highlight what are the technological developments on ocean observation. This presentation could be a technical briefing on ocean observation new markets and technologies, for example. Increasing the knowledge of potential investors about ocean observation is crucial.

The meeting concluded that there is an interest to share the work done on ocean observation markets by both organisations.

## 7. Conclusion

From the benchmark on the involvement of industrials in the existing RIs, few companies are on board. The scientific community comprises and manages RIs almost alone as much in the field of marine environment as in the other domains. This situation is often due to the legal status of RIs and the lack of clear return on investments for the potential industrial partners. ENVRI recommendations are to be considered and are a necessary condition for the establishment of a sustainable RI but are not sufficient.

When it comes to GROOM RI, the results of the questionnaire sent to companies and the three IAG MAS workshops clearly demonstrated that there is an appetite for industrials to join the project. From the research carried out for this deliverable, several conditions for a sustainable involvement of industrials come out. This conclusion will highlight them and demonstrate how to address GROOM RI mission that is to provide access to platforms and services to the broadest range of scientific and industrial users.

Regarding the markets targeted by the future GROOM RI, the positioning on Ocean observation is totally shared with industry. However, other traditional markets such as defence and maritime surveillance, or emerging markets such as renewable energy and deep minerals and energy resources are very important for them. These markets are supported by innovative technologies where they are very skilled and which are (or could be) at the heart of the future RI: advanced automatic navigation and planification of mission using AI, passive and active real time acoustic sensors and monitoring, data acquisition and treatment.

As mentioned in section 5.3 - State of play of industry involvement in the marine domain RIs - it is clear that the European companies interested by GROOM, belong to the worldwide leaders of marine autonomous vehicles and instrumentation, and could be highly qualified suppliers of the RI. They could be partners in the integration of engineering services and development of hardware equipment not limited to MAS and their maintenance. However, their expectations go beyond that, and they would rely on the future RI to showcase their products and services, increase their client portfolio and participate and contribute to scientific studies.

The collaboration inside the RI between scientists and industrials to develop innovative projects could be an answer to them, the RI providing the cooperation framework. They are also opened to enlarge their network and quality services with other partners of the RI including other companies. Thus, the RI could play a central role for a secure dissemination of information inside and outside the RI.

To encourage the involvement of industrials in GROOM RI, especially on the development of innovative projects inside the RI, a partnership with BlueInvest would be extremely helpful. They are interested in and could bring investment readiness support to SMEs and maybe facilitate the creation of links between the RI and private investors.

When it comes to the governance of the RI, the legal status will be a key factor to ensure the active participation of the private sector. However, most interviewees are ready to join the RI if a return on investments is clearly established in terms of innovative products and equipment's development, qualification, showcasing and training. In this case paying a fee or providing in-kind contribution could be considered by industrials.

Finally, considering the positive perception of both IAG-MAS members and respondents which are not members yet, the project coordination should closely associate them to the finalisation of GROOM RI design study, as it is key to fully address GROOM vision and mission statement. It is by pursuing and enhancing the association of these key players already interested in GROOM RI to the next steps of GROOM II project, that they will then be willing to financially support the creation of the structure.

## 8. Annexes

### 8.1. QUESTIONNAIRE – EXPECTATIONS FROM INDUSTRIAL MEMBERS REGARDING THE FUTURE GROOM RI

#### INTRODUCTION

GROOM RI aims to be the European Research Infrastructure (RI) harnessing the advantages of Marine Autonomous Systems (MAS). GROOM RI provides high-quality ocean observation data and services for the benefit of society both enabling scientific excellence and moving towards net-zero activities. This European RI integrates national infrastructures for Marine Autonomous Systems (MAS) to provide access to platforms and services to the broadest range of scientific and industrial users, as well as other ocean observing RIs. It maintains a unique centralised provision of cyber-infrastructure, data and knowledge for the optimised use of MAS to study climate and marine environments as well as support operational services and the blue economy.

GROOM RI will play a key role as a facilitator that matches industrial members' needs, promotes their products & services and develops healthy collaboration. The GROOM II project intends to create an advanced design of this research infrastructure. By collecting information about your industrial needs and activities, your collaboration will guide our decisions about the legal, technical and scientific structure of the RI so it fits your needs.

The consortium is composed of 14 partners in 12 countries including France, Germany, Cyprus, Norway, United-Kingdom, Ireland, Greece, Spain, Portugal, Finland, Sweden and the Netherlands. All information related to partnerships are available here.

The results of this survey will help us reach our objective to optimally design the RI. By collecting information about your industrial needs and activities, your collaboration will guide our decisions about the composition of the RI so it fits your needs.

By filling out this form you agree that we will process your data for the purposes of the GROOM II Project. All the collected information will be confidential. You can answer this survey by 31st October 2022.

#### 1. EXPECTATIONS AND NEEDS

GROOM RI aims to provide efficient services. The answers to the following questions will guide our understanding about your expectations and needs in regard to the RI.

##### **Q1.1 Indicate the service(s) that you are interested in and/or positioning your organisation on:**

- Mission planning and piloting (access to glider facilities, vehicles, sensors; shared planning, campaign coordination, piloting, ...)
- Hardware maintenance and development (new capability development, sensor integration and testing, scientific validation)
- Engineering services (glider servicing, sensor collaboration)
- Data management (online portal for access as part of the e-infrastructure, NRT QC, FAIR data dissemination into GOOS, EOOS, ENVRI communities)
- Capacity building and training (training, best practices - link to OBPS, etc., library services)
- Other (please specify)



**Q1.2 What could GROOM RI bring to your organisation?**

- Competitive intelligence
- Finding new prospects & clients
- International awareness
- Participation in scientific studies
- Scientific competitiveness
- **Showcasing your products and/or services**
- Other (please specify)

**Q1.3 How may GROOM RI promote your company?**

- Catalogue
- Online visibility: social media & website
- Conferences
- Dissemination to scientific experts and researchers and industrial actors
- Other (please specify)

**Q1.4. What are your expectations when cooperating with other members & stakeholders of the RI?**

- Develop high quality services (joint development)
- Develop your network (customers, partners, experts)
- Share costs (missions, projects, communication, ...)
- Share resources
- Other (please, specify)

**Q1.5. Since the GROOM RI acts as a facilitator, which measures should be considered to guarantee a healthy collaboration?**

- Access to software and/or hardware
- Specific agreement of cooperation, including non-competition in some situations
- Validation of disseminated information (news, promotion of your activities, ...)
- Other (please specify)

**2. MARKETS AND POSITIONING**

GROOM RI will be tailored to your needs. The answers to the following questions will guide our understanding of which markets you address, what type of services you offer, and which emergent markets you may be interested in in the future.

**Q2.1. In which market(s) are you currently positioned?**

- Data management
- Data provider
- Defence & marine surveillance
- Marine environment observation
- Marine renewable energy including its environmental impact on marine & coastal ecosystem
- Offshore & deep offshore non-renewable energy & minerals
- Sensor(s) developer & provider (chemical, nutrients, etc.)
- Survey & maintenance of marine infrastructures (including ports, artificial reefs, telecommunication cables...)
- Other (please specify)

**Q2.2. Of these emerging sectors, what are the 3 technological priorities for your industry?**

- Advanced automatic missions for new capabilities
- eDNA (invasive species, biodiversity)
- Methane & CO2 (GHG monitoring, budget estimates)
- Nutrient sensors
- Real time echosounders (fish, larvae, other plankton)
- Real time passive acoustic monitoring (PAM) (targets, wind, rain, marine traffic)
- Water sampling (pollution, water quality)
- Other (please specify)

**Q2.3. What are the technologies/products or services that you could make available to GROOM RI?**

Products / Services/ Technologies	Yes	No	I don't know yet
Acoustic sensors (measurement, detection, identification..)			
Autonomous Underwater Vehicle			
Positioning system			
Radio Communication & satellite communication			
Remotely Operated Vehicle (ROV)			
Surface uncrewed vehicle			
Underwater glider			
AUV (including gliders)			
Data report			
Surface drone services			
Training			
Buoyancy			
Data collection			
Embedded energy			
Mine clearance			
On-board intelligent command control			
Provide decision support			
Underwater communication (acoustic, optical ...)			

### 3. INDUSTRIALS INVOLVEMENT IN THE RI

This part aims to understand what your preferences regarding administrative aspects are and to evaluate your level of interest for this kind of infrastructure. No commitment is implied.

#### Q3.1. Would you be interested in being part of GROOM RI?

Yes, possibly → Q2

No, please specify the reason → end of the survey

#### Q3.2. Would you like to play an active role in GROOM RI governance?

- Yes, a consultative role
- Yes, a decision-making role
- I don't know yet → Q4
- No → Q4

#### Q3.3. What are your main motivations to participate in GROOM RI?

- For cooperation with other companies
- For cooperation with scientists
- To access information about products, markets, ...
- To access a network of professionals & scientists
- To add capabilities without significant new investments
- Other (please specify)

#### Q3.4. Would you consider making hardware, software or human resources available to the RI? (in kind)

- Yes, hardware
- Yes, software
- Yes, human resources
- I don't know yet
- No

#### Q3.5. Would you consider paying a membership fee to be part of the RI?

- Yes
- No
- Conditionally, yes, (please clarify)

#### Q3.6. Are you currently involved in another research infrastructure?

- Yes → Q7
- No

#### Q3.7. Specify the name of the research infrastructure, its objectives, and your role in this RI:

---

**GENERAL INFORMATION ABOUT THE RESPONDENT**

- Name
- Surname
- E-mail
- Organisation
- Position

**THANK YOU NOTE**

Thank you for taking the time to answer this survey. Your contribution will truly help us provide you with an innovative research infrastructure adapted to your needs.

**Do you have any questions or suggestions regarding this future RI?**

## 8.2. RESULTS OF THE QUESTIONNAIRE – EXPECTATIONS FROM INDUSTRIAL MEMBERS REGARDING THE FUTURE GROOM RI



GROOM  
II\_Questionnaire\_Analy

## 8.3. SURVEY ON EXISTING RIs AND THEIR RELATIONSHIP WITH INDUSTRY

### 8.3.1. Existing RIs

#### **INDUSTRY INVOLVEMENT IN THE OPERATIONAL RI BEFORE (AS OF PRESENT OR IN THE PAST, DEPENDENT ON CURRENT STATUS)**

##### **To what extent is industry involvement key to the RI?**

##### **What are the key benefits to industries to be involved in the RI in your experience?**

- For cooperation with other companies and/or new prospects
- For cooperation with scientists / state-of-the-art knowledge
- To access information about products, markets (business intelligence)
- To access a network of professionals & scientists/ ready-to go portal to further actions
- To add capabilities without significant new investments/shared resources
- Other (please specify):

##### **How are industries (going to be) involved in the operational RI?**

- Role: Supplier and/or user and/or co-creator?
- What types of preferred industries?

##### **How are industries (going to be) involved and encouraged to supply to the RI?**

###### What:

- Data
- Hardware
- Software
- Services
- Human resources

###### How/in return for:

- Specific compensation in kind (hardware, software, services, data, etc.) or financial
- General compensation: cooperation, networking, information

##### **How are industries (going to be) involved and encouraged to make use of the RI?**

###### What:

- Data
- Hardware
- Software
- Services
- Human resources

How/in return for:

- Membership fee
- Payment per use
- In kind: hardware, software, services, data, etc.
- Open access

**How are industries (going to be) involved in co-creatorship/decision-making?**

- Steering board
- PM

**Which measures are taken to guarantee a healthy collaboration?**

- Access to software and/or hardware
- Specific agreement of cooperation, including non-competition in some situations
- Validation of disseminated information (news, promotion of your activities, ...)
- Other (please specify)

**Existing operational RIs (EMSO, Euro-Argo):**State of play of industry involvement

- % Partners
- % Funding
- % Organisation involvement

Communication with (potential) industry partners

- Events, newsletters, meetings, workshops, personal encounters?

**INDUSTRY INVOLVEMENT IN THE PREPARATORY PHASE AND BEFORE (AS OF PRESENT OR IN THE PAST, DEPENDENT ON CURRENT STATUS)**

Strategy (experiences and lessons, do's and don'ts): targeted key partners vs many partners, at the earliest start or later (when?), collaboration and synergies with other RIs, role of MS/governments, industry platforms

- Distinguish between supplier, user, co-creator roles

In practice (experiences and lessons, do's and don'ts): how to raise industry awareness, how to involve industry partners or to convince industry to participate

- Distinguish between supplier, user, co-creator roles

### 8.3.2. RI (supporting) networks

#### ENVRII

ENVRII is a community of Environmental Research Infrastructures, projects, networks, and other related stakeholders

**To what extent is industry involvement key to ENVRII?**

**What are the key benefits to industries to be involved in ENVRII (and associated RIs) in your experience?**

- For cooperation with other companies
- For cooperation with scientists
- To access information about products, markets,
- To access a network of professionals & scientists
- To add capabilities without significant new investments
- Other (please specify):

**How are industries (going to be) involved in ENVRII? And the RIs, that are part of your network (do you have an overview)? Industry involvement at the ENVRII level versus individual RI level**

- Supplier and/or user and/or co-creator?
- Funding? In kind, fee

**Which measures are taken to guarantee a healthy collaboration?**

- Access to software and/or hardware
- Specific agreement of cooperation, including non-competition in some situations
- Validation of disseminated information (news, promotion of your activities, ...)
- Other (please specify)

**How do you support RIs with industry involvement? How is the community beneficial to individual RIs? What would you recommend to GROOM to involve industries?**

#### ENRIITC

ENRIITC (the ENRIITC project aims to build a permanent pan-European network of Industrial Liaison and Contact Officers (ILOs and ICOs) and enable industry to become a full partner of research infrastructures whether it is as a user, a supplier, or a co-creator)

**To what extent is MAS, marine infrastructure and marine industries (the marine domain) represented by the current ENRIITC network?**

**What services do you offer to RIs to involve industries, how can you be of help?**

**What do you expect from GROOM to involve industries, what would be your advice to increase industry involvement by GROOM itself?**

## 8.1. ANSWERS TO THE SURVEY ON EXISTING RIs AND THEIR RELATIONSHIP WITH INDUSTRY

### 8.1.1. EMSO

#### Existing RI and their relationship with industry

RI: EMSO

#### Interview questions

##### 1. Financial sustainability with industry (aspired/established)

1.1 To what extent is industry involvement key to the RI? *Open question*

As EMSO is an ERIC, our statutes (publicly accessible at: <https://emso.eu/wp-content/uploads/2021/03/Amended-Statutes-EMSO-ERIC-.pdf>) states that EMSO "shall promote innovation and transfer of knowledge and technology, providing services and engage in partnerships with industry" and shall "support to the leadership of Europe in marine technologies and the sustainable use of marine resources, through partnership with industries and other relevant stakeholders";

On the other hand, Art.2 says that "EMSO ERIC operate on a non-economic basis. However, EMSO ERIC may carry out limited economic activities, they are related to its principal and Any income generated by these economic activities be used to further its purpose."

That is, the industry could moderately participate in the financial sustainability of the ERIC, by definition, but at the same time a fundamental part of our mandate is to "promote innovation and transfer of knowledge and technology, providing services and building partnerships with industry".

In conclusion, for EMSO as an infrastructure with an important technological component, the industry is a key partner and we are committed to developing a permanent collaborative framework to deal with the industry on a daily basis. Training, physical, remote and virtual access, and co-development in HE projects or on a structural basis are the three pillars on which the cooperation with the industry is organized in EMSO ERIC.

Finally, EMSO is one of the main actors these days in developing a European Strategy for improving the relationships between EU RIs and the Industry. In this regard, EMSO has been the main author of deliverable 3.1 (and contributed to D2.1, D3.2, D3.3) in the H2020 ENRIITC project (<https://enriitc.eu/project/deliverables/>), about the "Strategy to exploit the RIs innovation potential" that builds upon the work done by EMSO in the D18.5 of the H2020 ENVRI-Plus project.

It is essential that the EU RIs take care both of the downstream and upstream parts of the collaboration with the Industry, facilitating the process to have it as a full partner in order to enhance the socio-economic impact of RIs, especially in the regional areas, and feed the European Innovation Ecosystem with the cutting-edge technology and knowledge that only the RIs can provide.

1.2 What are the key benefits to industries to be involved in the RI in your experience? *Open question.*

Potential answers:

For cooperation with other companies and/or new prospects

To access information about products, markets (business intelligence)

To access a network of professionals & scientists/ready-to-go portal to further actions

To add capabilities without significant new investments/shared resources

Other (please specify): One of the most immediate benefits for the industry is having personnel trained in specific topics where the scientific community is most advanced. This is achievable with collaboration and the benefits are more or less immediate. The other important point is the development of new technology; indeed the industry needs to have access to cutting-edge technology and locations that only RIs could provide. From access to the RIs' facilities, new ways of collaboration could arise paving the way to establish a permanent dialogue which is the ultimate goal.

1.3 How are industries (going to be) involved in the operational RI?

(Potential) roles:

Supplier and/or

User

And/or co-creator

What types of preferred industries? *Open question*

As said in the previous questions, the ultimate goal is to have the industry as a partner of EMSO, working as an external branch in the context of developing an Open Infrastructure able to quickly adapt to external changes and respond to the new societal challenges. The Industry could be an extremely powerful resource for the RIs not only as suppliers to support business continuity or as users to maximize the impact but also as co-developers being complementary to the RIs and helping in moving to the highest TRLs.

1.4 In case of supplier: How are industries (going to be) involved and encouraged to supply to the RI?

What Open question, potential answers:

Data

Hardware

Software

Services

Human resources

We are exploring new collaboration models that entail the exchange of services and collaboration in the development of new services and software. In the first case, providing the possibility of giving access to our facilities to develop new sensors and at the end of the process having some of those sensors for our observatories. In the second case, we are going to co-develop AI software for the analysis of scientific data contributing with our experience to improve the software itself.

How/in return for Open question, potential answers:



Specific compensation in kind (hardware, software, services, data, etc.)

Specific financial compensation

General compensation: cooperation, networking, information

1.5 In case of user: How are industries (going to be) involved and encouraged to make use of the RI?

What Open question, potential answers:

Data

Hardware

Software

Services

Human resources

We provide unique time series of EOVs coming from the deep sea that are extremely valuable for the industry. We also provide access to unique test sites around Europe with the possibility for the industry to test devices and sensors in an end-use environment. We are also giving an incentive for the users that apply to our calls for physical access in order to cover the travel expenses.

How/in return for Open question, potential answers:

Membership fee

Payment per use

In kind: hardware, software, services, data, etc.

Open access

We are just asking the users of our training courses during the Time series Conference to pay for the usual fee.

1.6 In case of co-creator: How are industries (going to be) involved in co-creatorship/decision-making?  
*Open question.*

*At EMSO ERIC, we have had the opportunity to start collaborating with the industry in the design of a compact frame which includes several marine sensors, called EGIM\* (Lanteri et al., 2022), this process began within the frame of a European project (EMSODEV), and after some issues with the IPR, these have been transferred to the EMSO community, which will allow us to evolve in the near future in this first joint development.*

Reference: Lanteri, N. [et al.]. The EMSO Generic Instrument Module (EGIM): Standardized and Interoperable Instrumentation for Ocean Observation. "Frontiers in marine science", 18 Març 2022, vol. 9, p. 801033:1-801033:17. DOI [10.3389/fmars.2022.801033](https://doi.org/10.3389/fmars.2022.801033)

1.7 Existing operational RI's state of play of industry involvement, i.e. :

% funding: 0,1%

Number of industrial users/suppliers: 7 users, 8 suppliers surveyed at Regional facilities' level

Developments in the past and expected: co-development of the EGIM, sponsorships of events, training users, and suppliers. In the future, we expect to develop in addition exchange of personnel, internships and brokerage events.

Governance of the RI : not at the moment

**2. Measures to secure industry involvement**

2.1 ENVRI has developed 14 key recommendations RIs need to put in place in order to establish a common baseline for developing systematic innovation-partnering industry-liaison programs.

To what extent are the following recommendations addressed in the RI?

Recommendation	Adressed (yes/no/working on it/n.a.)	Explanation and/or references
1.Introduce "Innovation Cooperation with Industry" as a priority in the RI's Annual Strategic Plan	working on it	
2.Ensure that its website homepage has a high-level "Industry" or "Innovation" menu tab and section	working on it	
3.Prepare an annual Innovation and Industry-Liaison Strategy as an annex to the RI Business Plan	working on it	Key elements: events, training, knowledge exchange, personnel exchange.
4.Hire a full-time Innovation/Industry Liaison officer(s) > ILO	yes	Following the new vocabulary of the EC <a href="https://cordis.europa.eu/project/id/871112">https://cordis.europa.eu/project/id/871112</a> ILO and ICO are not what mentioned in this document.
5.Hire a Communications Officer(s) with commercial experience > ICO	yes	COM Officers that have worked in the private sector as well are more aware of what would it be like working in a market-driven environment.

6. Set a target for how much cooperation with Industry should ideally contribute to RI annual revenues (%)	working on it	What %? Target vs reality: the answer depends on the definition of the %. Should it include the contracts at local level?
7. Establish a multi-disciplinary, gender-balanced, Industry Advisory Committee	working on it	It is strongly dependent on the size of the RI and on the budget allocated for dealing with the industry.
8. Highlight four Industry-cooperation Success Stories on its website and in annual reports to the EC and ESFRI	working on it	EMSO suggested to ESFRI to include also the success stories coming from the ESFRI RIs in a dedicated section of the ESFRI Roadmap
9. Make sure its Data Portal offers users open, user-friendly access to RI data and services	yes	
10. Publish an online RI Services Catalog, inclusive of specific services/opportunities for/with industry	working on it	We are developing it in the ENVRI-Fair project for the ENVRI RIs.
11. On its website, make readily available a standard R Service-level Agreement and IP Policy Guideline for SMEs interested in licensing RI data to (co-)develop value-added products and applications	working on it	
12. Establish an annual Training Action Plan and Program as annexes to the Business Plan in consultation with industry to bring together RI researchers and company engineers and managers	working on it	We are going to launch soon a training platform with a specific section dedicated to industry
13. Develop an RI Talent-Attraction Exchange Program with industry to train the next generation of young scientists and engineers;	working on it	This part will be launched together the 12

Those key recommendations have been developed by EMSO during the ENVRI-Plus project in deliverable 18.5 and have been improved in D3.1 of ENRIITC.

2.2. What are the key success/fail factors for industry involvement/cooperation/funding, either from the ENVRI recommendations above or in your (personal)experience? Can you give a specific example? *Open question.*

We have identified the most important ones in the D3.1, D2.1 of ENRIITC <https://enriitc.eu/project/deliverables/>

In our specific case, we find it really useful to start with training and involving SMEs in EU projects. The co-development part, since involves IPR issues, is the most time-consuming and administrative complex way so far, but at the same time, it should be one of the final goals.

**3. Participation in Pan-European networks facilitating industry involvement**

3.1. To what extent does the RI (plan to) participate in the ENRIITC project? To what extent does the RI's ILO/ICO liaise with other RIs? *Open question.*

We are a beneficiary of the ENRIITC project and we are working on the follow-up.

We are involved in the relationships with the industry-related matters in ENVRI-Fair and ERIC Forum as well. We are closely in contact with ICOs from other RIs.

3.2. How is your RI benefiting/could/would your RI like to benefit from cooperation with pan EU networks such as ENVRI and ENRIITC as regards of industry involvement? *Open question.*

We believe that is fundamental to increase the capacity of EU RIs to work with pan EU networks abovementioned. We strongly need a collective effort to build permanent structures like the European Hub proposed by ENRIITC to support the EU RIs on daily matters like IPR, training, best practices and the organization of brokerage events.

### 8.1.2. Euro-Argo

#### Existing RI and their relationship with industry

##### RI: Euro-Argo

##### Interview questions

The value chain of Argo data is long. Euro Argo ERIC is delivering data and data products which are used by institutional service providers such as the Copernicus Marine Service. Hence, Euro Argo ERIC has no direct link to potential industrial users or possibility to develop services for industry. This reduces interactions with industry to the role of commercial supplier.

##### 1. Financial sustainability with industry (aspired/established)

1.1 To what extent is industry involvement key to the RI? *Open question.*

Personally, I don't see industry becoming a financial contributor in support of Euro Argo operations - the situation may be different for MAS. On the other hand, cooperation with industry, e.g. for technological developments, is mostly, if not exclusively, via EU-funded project.

1.2 What are the key benefits to industries to be involved in the RI in your experience? *Open question.*

*Potential answers:*

For cooperation with other companies and/or new prospects

For cooperation with scientists / state-of-the-art knowledge:

**Industry is involved with Euro Argo ERIC almost exclusively for technological developments. This happens mostly, if not exclusively, via EU-funded project.**

To access information about products, markets (business intelligence)

To access a network of professionals & scientists/ ready-to go portal to further actions

To add capabilities without significant new investments/shared resources

Other (please specify):

1.3 How are industries (going to be) involved in the operational RI?

Roles:

As suppliers and/or

User

And/or co-creator

There have been cases of sponsorship by industry but only to an extremely limited, quasi anecdotal level. Industrial involvement contributing to the sustainability of Euro Argo ERIC operations is excluded, even at a minimal level.

What types of preferred industries? *Open question*

1.4 In case of supplier: How are industries (going to be) involved and encouraged to supply to the RI?

*What Open question, potential answers:*

Data

Hardware

Software

Services

Human resources

**Exclusively as suppliers of floats and sensors (which are purchased by the ERIC and its entities).**

*How/in return for Open question, potential answers:*

Specific compensation in kind (hardware, software, services, data, etc.) or financial

General compensation: cooperation, networking, information

**As commercial actors selling equipment.**

1.5 In case of user: How are industries (going to be) involved and encouraged to make use of the RI?

*What Open question, potential answers:*

Data

Hardware

Software

Services

Human resources

*How/in return for Open question, potential answers:*

Membership fee

Payment per use

In kind: hardware, software, services, data, etc.

Open access

1.6 In case of co-creator: How are industries (going to be) involved in co-creatorship/decision-making? *Open question.*

1.7 Existing operational RI's state of play of industry involvement, i.e.:

**Zero % funding,**

**Number of industrial users/suppliers: the number of suppliers is rather limited given the small market.**

Developments in the past and expected: **none**

Governance of the RI: **none**

2. Measures to secure industry involvement

2.1 ENVRI has developed 14 key recommendations RIs need to put in place in order to establish a common baseline for developing systematic innovation-partnering industry-liaison programs.

To what extent are the following recommendations addressed in the RI?

Recommendation	Adressed (yes/no/working on it/n.a.)	Explanation and/or references
1.Introduce "Innovation Cooperation with Industry" as a priority in the RI's Annual Strategic Plan	Included in the Euro Argo Strategic Plan.	As part of EU-funded projects.
2.Ensure that its website homepage has a high-level "Industry" or "Innovation" menu tab and section	NO	
3.Prepare an annual Innovation and Industry-Liaison Strategy as an annex to the RI Business Plan	NO	Key elements?
4.Hire a full-time Innovation/Industry Liaison officer(s) > ILO	NO	
5.Hire a Communications Officer(s) with commercial experience > ICO	NO	
6. Set a target for how much cooperation with Industry should ideally contribute to RI annual revenues (%)	NO	What %? Target vs reality
7. Establish a multi-disciplinary, gender-balanced, Industry Advisory Committee	NO	
8. Highlight four Industry-cooperation Success Stories on its website and in annual reports to the EC and ESFR1	NO	
9. Make sure its Data Portal offers users open, user-friendly access to RI data and services	Argo data are publicly and freely available.	

10. Publish an online RI Services Catalog, inclusive of specific services/opportunities for/with industry	NO	What services?
11. On its website, make readily available a standard R Service-level Agreement and IP Policy Guideline for SMEs interested in licensing RI data to (co-)develop value-added products and applications	NO	
12. Establish an annual Training Action Plan and Program as annexes to the Business Plan in consultation with industry to bring together RI researchers and company engineers and managers	NO	
13. Develop an RI Talent-Attraction Exchange Program with industry to train the next generation of young scientists and engineers;	NO	

2.2. What are the key success/fail factors for industry involvement/cooperation/funding, either from the ENVRI recommendations above or in your (personal) experience? Can you give a specific example? *Open question.*

See introductory remark above the questionnaire.

3. Participation in Pan-European networks facilitating industry involvement

3.1. To what extent does the RI (plan to) participate in the ENRIITC project? To what extent does the RI's ILO/ICO liaise with other RIs? *Open question.*

Not considered: see comment above.

3.2. How is your RI benefiting/could/would your RI like to benefit from cooperation with pan EU networks such as ENVRI and ENRIITC as regards of industry involvement? *Open question.*

Euro Argo ERIC is strongly involved in ENVRI but not for the issues regarding industry involvement as understood from the questionnaire. See comment above for ENRIITC.

## 8.2. MEETING MINUTES OF THE IAG-MAS WORKSHOPS

### 8.2.1. Workshop #1

GROOM II – GA N° 951842

IAG-MAS Workshop #1 Meeting minutes



Project acronym: GROOM II

Project title: Gliders for Research, Ocean Observation & Management: Infrastructure and Innovation

Grant agreement no. 951842

### IAG-MAS: Industry Advisory Group for Marine Autonomous Systems

#### Workshop #1 Meeting minutes

Dissemination level		
PU	Public	X
CO	Confidential, only for members of the consortium	

#### DISCLAIMER

The contents of this publication are the sole responsibility of GROOM II consortium and do not necessarily reflect the opinion of the European Union.



GROOM II – GA N° 951842

IAG-MAS Workshop #1 Meeting minutes

### 1. Welcome and agenda

Objectives of the workshop:

- Building collaboration and trust
- Identifying and describing commercial needs for services ad for innovation
- Ideas for potential examples of cooperation

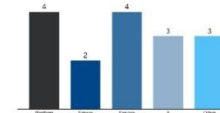
In practice:

- Ice Breaker
- Concept of the GROOM Research Infrastructure
- Interactive discussion about environmental monitoring using MAS

### 2. Ice Breaker

Participants were well distributed among the different categories of stakeholders. Among the 3 “other” responses, one participant was a digital solution provider (data management and interpretation layer / deployment simplification layer).

Which category of stakeholders are you part of?



What sector(s) is/are your main line(s) of business activity or target of your product/service?

Data management	Ecosystem monitoring	Autonomous vehicles
Research fisheries	Data provider	Ocean observation
Autonomous vehicles	Data management	Oceanographic research/CTD + bio-geochemical sensors
Autonomous profiling platforms	Ocean observation	Manufacturing of autonomous underwater vehicles
SCOD idea to facilitate collaboration between academic, industry and public sector.	CTD & sensors development	autonomous vehicles operations, data collection and data interpretation

### 3. Concept of GROOM Research Infrastructure (RI) and IAG-MAS

#### 3.1. GROOM RESEARCH INFRASTRUCTURE CONCEPT

Groom RI is about making Ocean gliders and long-range autonomous systems widely accessible in large numbers to three categories of users:

- Research and academic users
- Observing systems and statutory monitoring
- Industry and beyond



**GROOM RI VEHICLES**

Ocean gliders, long range autonomous systems (gliders, surface vehicles, long range underwater vehicles) because they have unit characteristics (complex data sets, way of operating and managing those sets is different from a buoy or a ship).

GROOM partners currently represent 36 gliderports where gliders and surface vehicles are operated and can be accessed by the users.

**VISION STATEMENT OF FUTURE RI**

To be the leading European Research Infrastructure in the provision of high-quality ocean observation data and services for the benefit of society, enabling scientific excellence through harnessing the advantages of Marine Autonomous Systems (MAS).

**MISSION STATEMENT**

This European RI integrates national infrastructures for MAS to provide access to platforms and services and expertise to the broadest range of scientific and industrial users.

It maintains a unique centralized provision of cyber-infrastructure, data and knowledge for the optimized use of MAS to study climate and marine environments and to support operational services and the blue economy.

**OBJECTIVES**

As a formal entity, the RI will ensure cooperation, coordination, integration, and simplification to provide access to world-class marine autonomous services. The RI will:

- Connect scientists and industry with autonomous marine platform operators and integrators
- Support research, management, and blue economy (help create knowledge, technology, services)
- Ensure high value data production and good access to data which flows for societal benefits
- Guide technological development, best practices, frontier science and process studies

**WHY HAVE A RI?**

- Increased need and value for low carbon ocean observations
- Rapid rise of glider, long-range AUV and surface vehicle technology and near real time data availability
- New technological developments that enable effective and secure data sharing, data integration and data enrichment.

Added Value of the MAS Research Infrastructure:

- Reduce fragmentation of the research and innovation ecosystem
- Avoid duplication of effort
- Joint force to construct and run large, complex or expensive infrastructures
- Invite industries to the co-developments of new technologies, methods
- Use scientific collaboration to address common problems and build partnerships
- Serving the blue economy by offering opportunities to industries to develop, test, and demonstrate their products
- Respond adequately and timely to global challenges.

**3.2. IAG-MAS CONCEPT**

**OBJECTIVES**

- Strengthen relationship between industrial & national/EU scientific & technical stakeholders
- Develop a cooperative framework between researchers & MAS service providers for GERI access
- Identify & advance priorities for innovation in developing new MAS and products & applications
- Exchange views on the industry’s needs & the available assets & expertise in GROOM
- Most importantly, produce a set of inter-related outcomes for the emerging research infrastructure

**EXPECTATIONS OF MEMBERS**

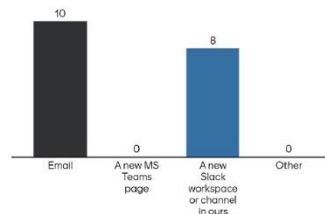
- Involvement in designing the workshop agendas & highlighting key challenges to be addressed
- Identification & mobilization of key national & (preferably) European actors for these workshops
- Identification of frameworks for effective, sustainable operation in receptive industrial sectors
- Provide advice on financial targets & potential legal structure
- Identification of European funding opportunities related to priorities above
- Help Develop:
  - o High-impact services for new & emerging markets in the Blue Economy
  - o Environmental services for industries that benefit from marine robotic monitoring
  - o Key societal benefits of a sustainable marine research infrastructure

**IN PRACTICE**

Meeting schedule, format, and agenda:

- 3 virtual meetings, 2h each
- Roundtable offline through short biographies
- Agenda and minutes to be circulated to all members

**HOW CAN WE BEST KEEP YOU UPDATED?**



In accordance with participant’s votes, a slack workspace will be created in GROOM II account. Communication via e-mail will be continued.

**4. Discussion - Environmental Monitoring Services**

**QUESTIONS FROM THE IAG-MAS MEMBERS**

“GROOM wants to suggest a way of handling the data from gliders and long-range autonomous vehicles which would be revolutionary because currently all the data is separated by data type. Does GROOM really intend to maintain the data on a long-term data base for data that comes from a certain platform?”

GROOM RI will not necessary be the one holding the database but may be the one helping to design the infrastructure or best practices that are needed for national and global centres to maintain those databases in a way that can be easily accessed by everyone.

Currently, we have platforms collecting different types of data, going to different repositories. The key thing we need to have within the RI is a central discovery mechanism so we can get to this data cleanly and easily.

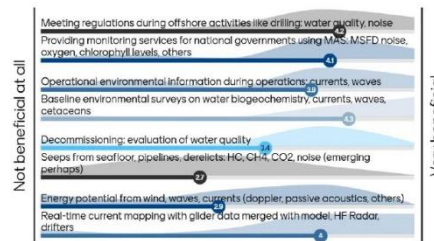
“GROOM is one of these large European infrastructures where you have a lot of gliders and skills across the value chain. Of course, you would like to bring this to the industry but what I often see with these large European infrastructures is that they miss to connect and work with the industry because often the industry needs very flexible and adaptive subcontractors. One of the questions is to answer is: do you have within GROOM this adaptability and flexibility and if not, can you develop this to answer the industry’s needs.”

We do not imagine GROOM as the one providing the service in fact. We want to help companies who need to move quickly and get asset and expertise matching their need. GROOM RI’s role is more a **facilitator role** which is why we need feedbacks from the industry.

**QUESTIONS FOR THE IAG-MAS MEMBERS: ENVIRONMENTAL SERVICES FOR INDUSTRY’S NEEDS**

- Does the standardisation done at the international level for science works for industry and if it does not work what differences do we need to implement to work better with industry and provide better data?
- What type of assistance the future infrastructure could offer to industries that carry out or support marine monitoring?
- What legal, administrative, or logistical “pain” is being alleviated or what value proposition does RI offer?

**4.1.1. How beneficial would the following examples of services offered by the RI be for you / your organisation?**



“What Dan has just said is that if there was private industry to offer certain types of observational services it would not be the RI to compete on these things. Now we talk about services that the RI would potentially offer. Shall we assume that the RI would handle the services that you do not find commercial partners to handle with?”

We want to **assist** the operators (IAG-MAS members, industry) to do the services, we do not want to compete. The services would be offered by the private industry supported by the RI.

“It is important to differentiate the raw data with all the meta information and then processed data which will be directly useful to these different topics. It would be very difficult to centralise the raw data because it is coming from different places and collected in different ways, but it might be interesting to be able to centralise the processed data so that there is a common access for stakeholders to use this data for their application.s.”

Absolutely. When it comes to quality control data and processed data, it is important to have a data set that is accepted by the scientific community and thus by the authorities.

“National security rules around making measurements are an enormous hassle. Any unified support from GROOM here would be great.”

It helps to have partners in different partners in different countries to have more chances of getting the permit. Do you have specific issues?

Sweden is a very unpermitting environment.

Lobbying with an international network could help

Could you elaborate on this RI concept?

We are targeting distributed infrastructures (mobile, not centralised with a building and staff). The cyber infrastructure might be centralised, but the physical infrastructure and expertise is around. The details are not yet finalised. Regarding the relationship between the RI and the industry, it is necessary. Industry is a provider of instruments and at the same time governments are asking us to be closer to the downstream part of the activities of companies and societies at large. Several mechanisms push us towards the industry.

GROOM II – GA N° 951842

IAG-MAS Workshop #1 Meeting minutes

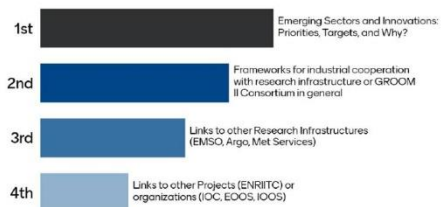
*Does the example have to be European? The US is ahead of the EU in terms of public private observation and use cases are merging*

The US has a different approach, but the funding approach is also different in other words it's a national centralised funding whereas in Europe the only funding model that works is Member States contribution.

**5. Next workshops (2 remaining)**

**5.1. WHAT DO YOU EXPECT OR WOULD LIKE TO DISCUSS IN THE NEXT WORKSHOP?**

Please rank these topics in relevance (for you). The most relevant one should be 1st



Open comments and feedbacks:

- Some individual interaction may help
- The legal aspects of MAS seem to be an outcome of this meeting
- Open slack channel to increase interaction, connexion
- "Working with industry" should be diversified and more clarified

For more information, contact GROOM II WP 5 leader, Daniel Hayes, [hayesdan@cyprus-subsea.com](mailto:hayesdan@cyprus-subsea.com).

GROOM II – GA N° 951842

IAG-MAS Workshop #1 Meeting minutes

**Participants**

Organisation	Name	Surname	Category
Akvaplan-Niva	Lionel	Camus	IAG-MAS Member
Alseamar	David	Diaz	IAG-MAS Member
ARMINES	Laurent	Mortier	GROOM II partner
ARMINES	Kamil	SZAFRANSKI	GROOM II partner
ARMINES	Yves	Ponçon	GROOM II partner
Cyprus Subsea Consulting & Services Ltd	Daniel	Hayes	GROOM II partner
Cyprus Subsea Consulting & Services Ltd	Jerald	Reodica	GROOM II partner
ECA Robotics	Marc	BATTAIS	IAG-MAS Member
ECORYS	Charlotte	Lucas	GROOM II partner
HCMR	Evi	Bourma	GROOM II partner
Kongsberg Maritime	Peer	Fietzek	IAG-MAS Member
Liquid Robotics-Boeing	Francois	Leroy	IAG-MAS Member
Marine Institute	Kieran	Reilly	GROOM II partner
MRV	Katherine (Kasia)	Zaba	IAG-MAS Member
MRV	Fritz	Stahr	IAG-MAS Member
National Oceanography Centre	Justin	Buck	GROOM II partner
National Oceanography Centre	Alvaro	Lorenzo Lopez	GROOM II partner
NOC Innovations Ltd: Marine Robotics Innovation Centre	Daniel	Woods	IAG-MAS Member
Offshore Sensing AS	David	Peddie	IAG-MAS Member
PLOCAN	Andres	Cianca	GROOM II partner
Pôle Mer Méditerranée	Charlène	Aurégan	GROOM II partner
Pôle Mer Méditerranée	Colin	Ruel	GROOM II partner
RBR	Didier	Clech	IAG-MAS Member
BE	Thomas	Mitchell	IAG-MAS Member
SCOOT	Torsten	Linders	IAG-MAS Member
University of Gothenburg	Bastien	Queste	GROOM II partner
VOTO-Ocean Knowledge pillar	Olle	Peterson	IAG-MAS Member
<b>Total</b>			14 consortium members
			13 IAG-MAS members



8.2.2. Workshop #2

GROOM II – GA N° 951842

IAG-MAS Workshop #2 Meeting minutes



Project acronym: GROOM II

Project title: Gliders for Research, Ocean Observation & Management: Infrastructure and Innovation

Grant agreement no. 951842

**IAG-MAS: Industry Advisory Group for Marine Autonomous Systems**

*Workshop #2 Meeting minutes*

Dissemination level		
PU	Public	X
CO	Confidential, only for members of the consortium	

**DISCLAIMER**

The contents of this publication are the sole responsibility of GROOM II consortium and do not necessarily reflect the opinion of the European Union.



GROOM II – GA N° 951842

IAG-MAS Workshop #2 Meeting minutes

**1. Welcome and agenda**

Objectives of the workshop:

- Building collaboration and trust
- Answering concerns from the previous workshop: what is the positioning of the RI? What is its role regarding industry - fostering cooperation or competition?
- Reach a priority list or consensus on most suitable Emerging Sectors and Innovations for MAS

In practice:

- Review the concept of the GROOM RI
- Ice Breaker
- State of the art MAS
- What are the priority emerging sectors for the RI?
- Which goals would you like the GROOM RI to set in order to meet your needs?
- Interactive discussion: emerging sectors and innovations

**2. GROOM Research Infrastructure (RI) concept**

Groom RI is about making ocean gliders and long-range autonomous systems widely accessible in large numbers to three categories of users:

- Research and academic users
- Observing systems and statutory monitoring
- Industry and beyond

**GROOM RI VEHICLES**

Ocean gliders, long range autonomous systems (gliders, surface vehicles, long range underwater vehicles) because they have unit characteristics (complex data sets, way of operating and managing those sets is different from a boat or a ship).

GROOM partners currently represent 36 glider ports where gliders and surface vehicles are operated and can be accessed by the users.

**VISION STATEMENT OF FUTURE RI**

To be the leading European Research Infrastructure in the provision of high-quality ocean observation data and services for the benefit of society, enabling scientific excellence through harnessing the advantages of Marine Autonomous Systems (MAS).

**MISSION STATEMENT**

This European RI integrates national infrastructures for MAS to provide access to platforms and services and expertise to the broadest range of scientific and industrial users.

It maintains a unique centralized provision of cyber-infrastructure, data and knowledge for the optimized use of MAS to study climate and marine environments and to support operational services and the blue economy.



**OBJECTIVES**

As a formal entity, the RI will ensure **cooperation, coordination, integration, and simplification to provide access to world-class marine autonomous services**. The RI will:

- Connect scientists and industry with autonomous marine platform operators and integrators
- Support research, management, and blue economy (help create knowledge, technology, services)
- Ensure high value data production and good access to data which flows for societal benefits
- Guide technological development, best practices, frontier science and process studies

**WHY HAVE A RI?**

- Increased need and value for low carbon ocean observations
- Rapid rise of glider, long-range AUV and surface vehicle technology and near real time data availability
- New technological developments that enable effective and secure data sharing, data integration and data enrichment.

Added Value of the MAS Research Infrastructure:

- Reduce fragmentation of the research and innovation ecosystem
- Avoid duplication of effort
- Joint force to construct and run large, complex, or expensive infrastructures
- Invite industries to the co-developments of new technologies, methods
- Use scientific collaboration to address common problems and build partnerships
- Serving the blue economy by offering opportunities to industries to develop, test, and demonstrate their products
- Respond adequately and timely to global challenges.

It aims to **serve the blue economy by offering industries to develop, test, and demonstrate their products and respond adequately and timely to global challenges**.

**OBJECTIVES OF IAG MAS**

- **Strengthen relationship** between industrial & national/EU scientific & technical stakeholders
- Develop a cooperative framework between researchers & MAS service providers for GERI access
- **Identify & advance priorities for innovation** in developing new MAS and products & services
- Exchange views on the industry's needs & the available assets & expertise in GROOM
- Most importantly, produce a set of inter-related outcomes for the emerging research infrastructure

**3. Ice Breaker****1.1. IN YOUR OPINION, HOW COULD THE RI BE BENEFICIAL TO INDUSTRY?****RI BENEFITS FOR SENSOR MANUFACTURER & DEVELOPER**

- An adaption and integration work can be done once and proper if used several times on the same platform
- The RI could provide access to test and demonstrate new sensors.
- 'Frontier' innovation in the field on mini/micro sensor development
- Understanding the needs of users in terms of sensor and/or system integration.

**RI BENEFITS FOR SERVICE PROVIDER:**

- They would benefit from a focus on access to data and to the decision process of how data are collected, i.e. co-designing data collection.
- Reduce cost investment

**RI BENEFITS FOR PLATFORM MANUFACTURER & DEVELOPER:**

- Offer ready-to-use state of the art infrastructures for launch and recovery of underwater & surface vehicles
- Deal with regulation for autonomous navigation of systems
- Adapting technology to user requirements
- Reduce the development time

**OTHER**

- Public authorities: avoid them to buy themselves the equipment they need

**DISCUSSION:**

- Where do you categorize the large industries, like O&G, DSM, ...?

We envision service providers to be the link to larger industries.

- **What about standardization/best practices that a RI certainly would have to establish?**

- Can you clarify the role of the RI and why would we use it?

GROOM RI will **provide access to platforms, services and expertise**, and our mission is in adequation with Europe to foster the collaboration between actors, and to connect scientific and industries to reach objectives.

For example, if you would like to use autonomous platforms and you are not sure who has what and who can help you, then the GROOM RI would find other people using this technology and give you access to the technology, to the expertise to use it or handle and analyse the data. This is a work in progress, and this is why we ask you what would be beneficial for you.

Concretely, GROOM RI could act as a **knowledge base of the resources available in Europe**.

- How can we make existing data available and in a more open way? Not only what has been collected in the past but also what is planned? It would be helpful to make it more generally available and for general purposes.

**4. State of the art MAS**

We suggested that IAG MAS members make a presentation on one emerging innovation sectors that they find particularly interesting.

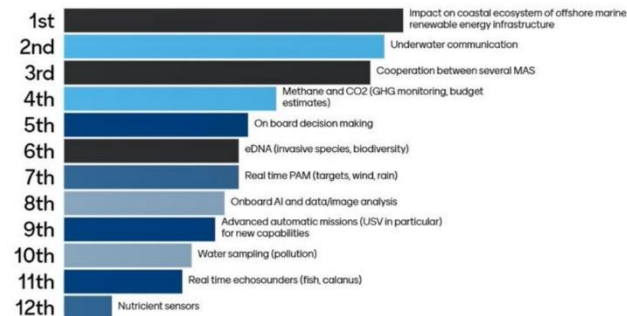
*Presentations from Andy Ziegwied (Ocean Data) and Dan Hayes (CSCS) are available in annex 1 and 2.*

**5. Discussion – Emerging sectors and innovations: priorities, targets and why?**

Potential examples:

- eDNA (invasive species, biodiversity)
- Real time echosounders (fish, calanus)
- Real time PAM (targets, wind, rain)
- Water sampling (pollution)
- Methane and CO2 (GHG monitoring, budget estimates)
- Impact on coastal ecosystem of offshore marine renewable energy infrastructure
- Advanced automatic missions (USV in particular) for new capabilities

**WHAT ARE THE PRIORITY EMERGING SECTORS FOR THE RI?**



The discussion allowed to reach a list of the sectors we consider as a priority. According to participant's votes, the priority emerging sectors for the RI are:

- Impact on coastal ecosystem of offshore marine renewable energy infrastructure
- Underwater communication
- Cooperation between several MAS

**QUESTION:**

- How can the GROOM RI identify the milestones to monitor the progress?

We have to determine how we will measure the progress. The performance indicators could be the number of research papers, articles, global integration, new collaborations, ...

**WHAT GOALS DO YOU THINK SHOULD BE SET FOR THE GROOM RI IN ORDER TO MEET YOUR NEEDS?**

- Facilitate cooperation between users to develop new demonstrators
- Identify the markets clearly to identify the RI's needs
- Recognize gliders (autonomous platforms) as important platforms (legally), alongside crewed ships
- Work on international acceptance for autonomous data collection platforms as non-military vehicles that can work in the EEZ
- Provide links or introductions to programs and/or observatories that use MAS and need new capabilities on those
- Offer a large set of MAS equipment that industrial companies could use to prove the interest of MAS to address several markets aimed (difficulties to find international standards, we should work to establish standards - where was the data collected? etc.)
- Set a "regulation-free" area for testing of autonomous vehicles
- Facilitate Cooperation between users to develop new demonstrators.

**IDENTIFIED ISSUES:**

- Recognized areas are needed to test AUV:

There is a necessity to create a unique system of autonomous data collection and identify recognized areas to test AUV. Rules are strict but some countries have already this kind of area in China, Norway, or Gran Canarias (Spain). In Spain, the National Agency for Maritime Issues is coordinating a working group on this topic and its links to the European initiative to implement the basis from the regulatory spectre. However, a lot of governmental and private stakeholders are involved, and it takes time to put it in action.

Renewable energy is clearly an emerging sector, and there is a lot of interest for the concerned country and the European Union and autonomous systems should play a key role for measuring what is happening and reduce cost.

- Lack of visibility on final targeted markets:

The market entrance seems to be done on technologies (that we have prioritised during the workshop), but technologies will be validated forwards the realisation of services linked with the market.

Monitoring marine pollution (like microplastics and drug molecules) became a major preoccupation all around the world and particularly in the Mediterranean Sea. All European States are concerned, and this topic will probably receive important funding in the next years. MAS economy is in a good position for growth.

Surveillance of Marine Protected Area (MPA) and marine parks are submitted to strict regulations but there is not enough control due to a lack of human resources. Marine autonomous systems will be part of the solution to ensure laws are respected in these areas. A functional board with technologies and markets will help us to accelerate our future actions.

**6. Next workshops (1 remaining)**

What do you expect or what would like to discuss in the next workshops? Any comments or feedbacks?

- Frameworks for industrial cooperation with research infrastructure or GROOM II Consortium in general (3 answers)
- Links to other Research Infrastructures and organisations such as the OOS's (2 answers)
- Conditions of coworking of competitors (for R&D of new products) within the same RI and all related privacy issues (1 answer)
- Cross the technologies identified as priorities with the existing and emerging markets (1 answer)

For more information, contact GROOM II WP 5 leader, Daniel Hayes, [hayesdan@cyprus-subsea.com](mailto:hayesdan@cyprus-subsea.com).

**Participants**

Organisation	Name	Surname	Category
Alseamar	David	Diaz	IAG-MAS Member
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ECORYS	Charlotte	Lucas	GROOM II partner
ECORYS	Jessica	Dirks	GROOM II partner
Hefring	Atle	Lohrmann	IAG-MAS Member
Marine Institute	Kieran	Reilly	GROOM II partner
Marine Institute	Sebastiaan	Swart	GROOM II partner
MRV	Katherine	Zaba	IAG-MAS Member
MRV	Fritz	Stahr	IAG-MAS Member
Ocean Data	Andy	Ziegwied	IAG-MAS Member
Offshore Sensing AS	David	Peddie	IAG-MAS Member
PLOCAN	Carlos	Barrera	GROOM II partner
Pôle Mer Méditerranée	Charlène	Auregan	GROOM II partner
Pôle Mer Méditerranée	Chloé	Bourillon	GROOM II partner
RBR	Didier	Clech	IAG-MAS Member
SCOOT	Torsten	Linders	IAG-MAS Member
Stratmar Conseil	Patrick	Baraona	GROOM II partner
4H-Jena	Nadja	Kinski	IAG-MAS Member
<b>Total : 23</b>	12 consortium members		
	11 IAG-MAS members		

### 8.2.3. Workshop #3

GROOM II – GA N° 951842

IAG-MAS Workshop #3 Meeting minutes



Project acronym: **GROOM II**

Project title: **Gliders for Research, Ocean Observation & Management: Infrastructure and Innovation**

Grant agreement no. 951842

#### IAG-MAS: Industry Advisory Group for Marine Autonomous Systems

#### Workshop #3 Meeting minutes

Dissemination level		
PU	Public	X
CO	Confidential, only for members of the consortium	

#### DISCLAIMER

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GROOM II – GA N° 951842

IAG-MAS Workshop #3 Meeting minutes

#### 1. Welcome and agenda

##### INTRODUCTION – 15 MIN

Objectives of the workshop:

- Building collaboration and trust
- Answering concerns from the previous workshop: what is the positioning of the RI? What is its role regarding industry - fostering cooperation or competition?
- Reach a priority list or consensus on most suitable Emerging Sectors and Innovations for MAS

In practice:

- Review the concept of the GROOM RI
- Ice Breaker
- Potential status of the future RI
- Services – Involvement of industrial members of GROOM RI
- Conclusion and next steps

Groom RI is about making ocean gliders and long-range autonomous systems widely accessible in large numbers to three categories of users:

- Research and academic users
- Observing systems and statutory monitoring
- Industry and beyond

##### GROOM RI VEHICLES

Ocean gliders, long range autonomous systems (gliders, surface vehicles, long range underwater vehicles) because they have unit characteristics (complex data sets, way of operating and managing those sets is different from a boat or a ship).

GROOM partners currently represent 36 glider ports where gliders and surface vehicles are operated and can be accessed by the users.

##### VISION STATEMENT OF FUTURE RI

To be the leading European Research Infrastructure in the provision of high-quality ocean observation data and services for the benefit of society, enabling scientific excellence through harnessing the advantages of Marine Autonomous Systems (MAS).

##### MISSION STATEMENT

This European RI integrates national infrastructures for MAS to provide access to platforms and services and expertise to the broadest range of scientific and industrial users.

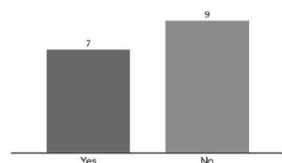
It maintains a unique centralized provision of cyber-infrastructure, data, and knowledge for the optimized use of MAS to study climate and marine environments and to support operational services and the blue economy.



**2. Ice breaker (Mentimeter)**

2.1. ARE YOU ALREADY INVOLVED IN A RESEARCH INFRASTRUCTURE?

Are you already involved in a Research Infrastructure?



7 industrials are already involved in a Research Infrastructure such as OTC (Ocean Thematic Centre) of the ICOS community, Ferry Box Community, EMSO, Euro Fleets and Argo.

**3. Potential legal status of the future RI**

3.1. LEGAL STATUS OF THE GROOM RI

GROOM II project focuses on structuring and developing MAS operations in Europe, and it designs the future European Research Infrastructure (GROOM RI). Some legal statuses are considerate:

- MoU's
- Association (AISBL-type)
- Join an existing RI or merge with another project
- ESFRI (European Strategy Forum on Research Infrastructure) roadmap and ERIC (European Research Infrastructure Consortium), status recognised by the European Union.

3.2. WEBINAR

GROOM II organised two webinars on Marine European Research Infrastructures. The **first one** is dedicated to understanding the different steps required to build an official and sustainable RI – what is at stake and what it implies. In this regard, knowledge exchange with other RIs is crucial, leading to better preparedness and avoidance of common pitfalls, duplication of work and competition. **It was held on Thursday 13<sup>th</sup> October 2022.**

The **second webinar** will be organised with the representatives of ERICs (EMSO, Euro-Argo, EMBRC) and another 'mature' AISBL (SeaDataNet, EuroGOOS) with the main question on how the legal status of the RIs affects the different services and the financial functioning of the RIs (exchanges of services between partners, etc). This webinar will be held in November 2022.

- *Do you see any restrictions regarding the legal status of the future RI?*

*"The important is to know how the company will interact with the RI and how we will be involved".*

*The function of the RI is more important than its legal status.*

**OBJECTIVES**

As a formal entity, the RI will ensure **cooperation, coordination, integration, and simplification to provide access to world-class marine autonomous services.** The RI will:

- Connect scientists and industry with autonomous marine platform operators and integrators
- Support research, management, and blue economy (help create knowledge, technology, services)
- Ensure high value data production and good access to data which flows for societal benefits
- Guide technological development, best practices, frontier science and process studies

**WHY HAVE A RI?**

- Increased need and value for low carbon ocean observations
- Rapid rise of glider, long-range AUV and surface vehicle technology and near real time data availability
- New technological developments that enable effective and secure data sharing, data integration and data enrichment.

Added Value of the MAS Research Infrastructure:

- Reduce fragmentation of the research and innovation ecosystem
- Avoid duplication of effort
- Joint force to construct and run large, complex, or expensive infrastructures
- Invite industries to the co-developments of new technologies, methods
- Use scientific collaboration to address common problems and build partnerships
- Serving the blue economy by offering opportunities to industries to develop, test, and demonstrate their products
- Respond adequately and timely to global challenges.

**It aims to serve the blue economy by offering industries to develop, test, and demonstrate their products and respond adequately and timely to global challenges.**

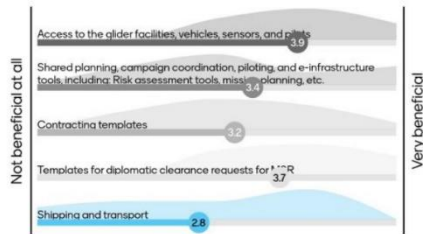
**OBJECTIVES OF IAG MAS**

- **Strengthen relationship** between industrial & national/EU scientific & technical stakeholders
- Develop a cooperative framework between researchers & MAS service providers for GROOM RI access
- **Identify & advance priorities for innovation** in developing new MAS and products & services
- Exchange views on the industry's needs & the available assets & expertise in GROOM
- Most importantly, produce a set of inter-related outcomes for the emerging research infrastructure

4. Services – Involvement of industrial members of GROOM RI

4.1. MISSION PLANNING & PILOTING

How beneficial would the following Mission Planning & Piloting services be for you and your organisation?



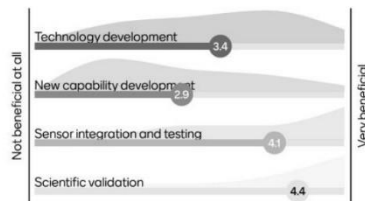
According to the participants, *access to the glider facilities, vehicles, sensors, and pilots* is the most beneficial services relating to mission planning and piloting. “Shared planning campaign coordination, piloting and e-infrastructure tools (including risk assessment tools and missions planning)” is the second most important service.

- *There will be a physical point for the RI?*

*“It will be a distributed infrastructure so it will be held by a head quarter relaying the services provided by the contact points in different countries. Some of them are already existing.”*

4.2. HARDWARE MAINTENANCE & DEVELOPMENT

How beneficial would the following Hardware Maintenance & Development services be for you and your organisation?

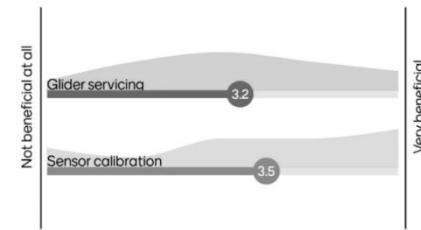


According to the participants, *scientific validation* and *sensor integration and testing* are the hardware maintenance and development services that will be the most beneficial for them. GROOM II project will build one unique roadmap to satisfy all the contact points which will be involved but also the industrials. *“You should show and prove the RI will create a real community, then you could address services that will be truly beneficial to the community.”*

4.3. ENGINEERING SERVICES

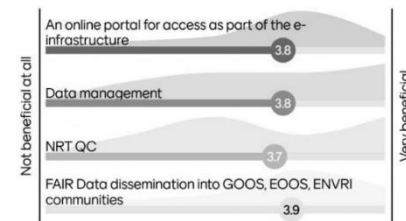
Sensor calibration seems to be the engineering services that will be the most beneficial for industrials. However, the gap between glider servicing and sensor calibration is minimal and both services should be considered in the future RI.

How beneficial would the following Engineering services be for you and your organisation?



4.4. DATA MANAGEMENT

How beneficial would the following Data Management services be for you and your organisation?



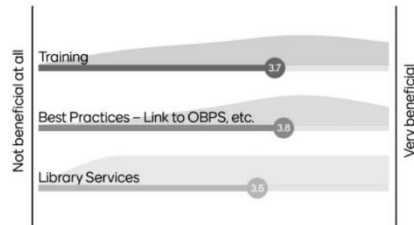
According to the IAG MAS members, these data management services should be considered because they are important for their companies, and they bring benefits:

- FAIR Data dissemination into G b OOS, EOOS, ENVRI communities
- An online portal for access as part of the e-infrastructure
- Data management
- NRT QC.

*"If you want to offer services, you should simplify a lot. If I want a service from a RI, I want to know if it works efficiently and seamlessly [...]".*

4.5. CAPACITY BUILDING & TRAINING

**How beneficial would the following Capacity building & Training services be for you and your organisation?**



Regarding capacity building and training services, the best practices (link to OBPS, ...) are the most beneficial for industries following by training and library services.

- *Do you have any suggestions for other services the RI could provide?*

*"You should think about the coordination deployments between platform (gliders, surface vessels, ...) services."*

5. Conclusion and next steps

5.1. QUESTIONNAIRE

As GROOM RI will have a facilitator role where industrials will be a key component, we need your help to define more precisely the RI. Please, give us your opinion by 31<sup>st</sup> October 2022 by filling in this online survey (5-10minutes): <https://ec.europa.eu/eusurvey/runner/survey-groom-ri-2022#page0>

Participants

Organisation	Name	Surname	Category
ARMINES	Laurent	Mortier	GROOM II partner
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Cyprus Subsea Consulting & Services Ltd	Jerald	Reodica	GROOM II partner
ECA Robotics	Marc	Battais	IAG-MAS Member
ECORYS	Charlotte	Lucas	GROOM II partner
KM Kongsberg	Peer	Fietzek	IAG MAS Member
Marine Institute	Kieran	Reilly	GROOM II partner
Marine Institute	Sebastiaan	Swart	GROOM II partner
Ocean Data	Andy	Ziegwied	IAG-MAS Member
Offshore Sensing AS	David	Peddie	IAG-MAS Member
PLOCAN	Carlos	Barrera	GROOM II partner
PLOCAN	Andres	Cianca	GROOM II partner
Pôle Mer Méditerranée	Charlène	Auregan	GROOM II partner
Pôle Mer Méditerranée	Chloé	Bourillon	GROOM II partner
Pôle Mer Méditerranée	Magali	Gebelin	GROOM II partner
Pytheas Technology	Rémi	Pascual	IAG-MAS Member
SCOOT	Torsten	Linders	IAG-MAS Member
Sea Bird	Jochen	Klinke	IAG MAS Member
SonarDyne	Aidan	Thorn	IAG MAS Member
Stratmar Conseil	Patrick	Baraona	GROOM II partner
UGOT	Bastien	Queste	GROOM II partner
4H-Jena	Nadja	Kinski	IAG-MAS Member
	François	Leroy	IAG MAS Member
<b>Total: 24</b>			14 consortium members
			10 IAG-MAS members

For more information, contact GROOM II WP 5 leader, Daniel Hayes, [hayesdan@cyprus-subsea.com](mailto:hayesdan@cyprus-subsea.com).



