The EuroMarine+ Business Plan
(DEL 2.4)

Presentation

Rationale

Since 2009, three marine Networks of Excellence, EUR-OCEANs, MarBEF and Marine Genomics Europe, have decided to joint efforts together in order to promote and develop the concept of a long-lasting integration with the development of common integrative activities. Such activities are sought to be described and organised in a global framework, the **EuroMarine+ Business Plan**, herewith presented.

Aims and objectives

This report (Deliverable 2.4) represents the EuroMarine+ Business Plan which details a set of EuroMarine+ business goals together with an action plan to reach those goals. The EuroMarine+ Business Plan aims to explore different sustainable income streams to operationalise/manage the planned integrative activities. It represents all aspects of business planning process detailing the vision and strategy alongside several sub-plans to cover dissemination, finance, operations and human resources aspects.

Expected outputs

The Business Plan outlines activities to be implemented during different phases of EuroMarine+ from 2014 onwards. It highlights key points for its future management, financial viability and networking activities, as to raise its visibility and impacts during the consecutive phases.

This business plan is a flexible document, which will be regularly updated especially according to the timing of activities proposed along the several phases.

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Summary of key points

- The **EuroMarine FP7 project** aimed to put in place the foundations of a long lasting integrative network in the marine research field: **EuroMarine+ (EM+);**
- EuroMarine+ aims to be a **operational platform** to ensure that bottom-up approaches and initiatives in the marine field are well balanced and complementary to top-down existing structures and initiatives;
- EuroMarine+ will be represented by a **mixed model** with a consortium as the governing body and a legal entity as a support management (incl. financial) unit;
- EuroMarine+ **research targets** will include research, access to research infrastructures and mobility, transfer of knowledge, policy advice and information priorities;
- EuroMarine+ strategic positioning is of key importance within the **European marine and maritime research landscape** (networks, organisations and projects);
- EuroMarine+ key activities will provide products and services for the benefits of the European marine and maritime research communities in relation to **science-policy interfaces, infrastructures, training, education and expertise** (see overview of activities and the SWOT analysis);
- EuroMarine+ budget for operating planed activities ranges from **317k€/year** (minimum-based scenario) to **685,5 k€/year** (optimum-based scenario);
- From 2014 onwards, EuroMarine+ will fulfil its functions according to an **action plan** composed of three consecutive and different operational phases: 1st phase - based on "in cash" and "in kind" contributions from members, 2nd phase - based on an enlarged consortium and tiered fees (access to specific EuroMarine+ services) and 3rd phase - with external funding (through links to marine research infrastructures, marine and maritime clusters, R&D projects);

1. General introduction to the Business Plan: the EuroMarine vision, mission and values

1.1 The EuroMarine challenge

Our Seas and Oceans are the last frontier on planet Earth, still little known but increasingly exploited for oil and gas, minerals and living resources. Exploration and sustainable exploitation of the marine environment are enormous challenges that require new knowledge from the natural sciences but also adequate management approaches based on social, economic and political sciences. Many questions in marine research can only be answered using multidisciplinary methodologies, from the molecular level with genomics and other new emerging technologies integrated with an ecological, physical and biogeochemical ecosystem approach. This will allow us to address novel questions in marine research, paving the way to new and more integrated knowledge systems that impact the way human society deals with the oceans. The challenge of EuroMarine is to bring marine sciences into the multidisciplinary perspectives of the 21st century. The scientific theme of EuroMarine *"From Genes to Ecosystems"* reflects this dynamic development based on the emergence of systems biology, new observational, analytical and modelling tools, new learning environments and better integration of the natural and social sciences. The EuroMarine consortium will build and strengthen a community of marine scientists from several hundred marine laboratories at institutes and universities in Europe, building the academic foundation for marine research that is the base for innovation. In the European context, this can only be achieved by collaborations between other marine and maritime initiatives currently under development, such as ESFRI projects, relevant ERA-Nets (Seas-ERA) and CSAs (MarineBiotech and OCEANS), the JPI OCEANS etc.

1.2 From FP6 NoEs to EuroMarine FP7 CSA

Three marine Networks of Excellence/NoEs (Marine Genomics Europe, EUR-OCEANS and MarBEF) were implemented under the 6th Framework Programme and were all developed in 2004 till 2009.
The summary boxes below inform about their main fields of interest and respective evolution throughout the development of the European marine research policy landscape.

Marine Genomics Europe (FP6 NoE)

- Objective: Promote, develop and spread throughout the European Union a broad range of genomic approaches, to investigate a wide range of questions related to the functioning of marine ecosystems and to the biology of marine organisms.
- Membership: MGE united 47 institutions from 16 countries (within and outside Europe). About 450 scientists were involved in MGE.
- Key activities: MGE was aimed at promoting, developing and spreading throughout Europe a better understanding of the functioning of marine ecosystems and the biology of marine organisms. Moreover, MGE has established databases of marine resources through large scale biodiversity studies.

EUR-OCEANS (FP6 project and the EOC consortium)
(European Research on Ocean Ecosystems under Anthropogenic and Natural Forcings)

- Objective: to assess the impact of climate/global change on marine ecosystems and biogeochemical cycles, and the construction of scenarios relevant to the emerging International Platform on Biodiversity and Ecosystem Services (IPBES)
- Membership: the EUR-OCEANS NoE gathered 64 research organisations; members of the Consortium that has followed up on the NoE since 2009 provide annual contributions to fund a project office and competitively selected scientific activities led by one or more of its member organisations. These activities may however

involve any former NoE members;

- Key activities: implement Joint initiatives between key Research Performing Organisations (RPOs) and Research Funding Organisations (RFOs) across Europe to help the community make significant jumps in marine sciences during the next decades. This is implemented by organizing and sponsoring activities which focus on hot topics only and can lead to wider European (FP8, JPI, ...) projects. These activities include Gordon-like conferences, flagship programmes, foresight workshops and public outreach.

MarBEF (FP6 NoE) and MarBEF+ (association)
(Marine Biodiversity and Ecosystem Functioning)

- Objectives: Assess the impacts of global climate change and the synergy of anthropogenic impacts additional to global warming; habitat diversity; ecosystem function; biodiversity diversity; the role of species; biodiversity at a genetic level; microorganism diversity; marine biotechnology. Integration and dissemination of knowledge and expertise on marine biodiversity, with links to researchers, industry, stakeholders and the general public. Promote the cooperation in the field of scientific research into marine biodiversity and the functioning of ecosystems and to perform any activity either related to the before mentioned, or conducive; Set-up exchange programs and sabbaticals for students and researchers, organizing working groups and trainings, making available infrastructural facilities, developing of information provisions for scientific, commercial and public use, promoting a European network on the field of marine studies in cooperation with the European Network of Marine Research Institutes and Stations (MARS) and Marine Genomics
- Membership: Marbef gathered 52 European marine institutes; MarBEF+ (Dutch association) aims at is to provide the long-term structure and create the opportunities for pan-European collaborative science to flourish.
- activities: identify relevant science priorities; provide Relevant expertise; Training activities (Erasmus Mundus projects on marine biodiversity); shared access to facilities; communication; common facilities; database; Stakeholder engagement.

Following two meetings held in Paris in July and September 2009 between the three NoEs, EUR-OCEANs, MarBEF and Marine Genomics Europe, the proposition was made to make a joint effort to promote and develop the concept of a long-lasting integration, the **EuroMarine+ network (EM+)**.
Four major priorities were identified for defining such a concept:

(1) Identify the new scientific challenges for marine sciences;
(2) Establish a European Doctoral School;
(3) Share scientific facilities;
(4) Promote the mobility of personnel.

Such a concept was framed under the FP7 CSA EuroMarine project ("Integration of European marine research networks of excellence - Euromarine ") which was launched in February 2011 for a duration of two years.

The **EuroMarine FP7 project** therefore aimed to:
- Capitalize on the integrative activities performed in MarBEF, MGE and EUR-OCEANS in order to lead the three communities to a higher level of integration, for building a common vision for the future and establishing a road map for joint programming and creating synergies between different scientific approaches;
- Strengthen and improve coordination and cooperation in marine research in Europe by applying the principle of subsidiarity, i.e. in close connection with other existing Coordinating/Networking projects and initiatives (for example Era-NET, ESFRI, FP7) of the European Research Area in Marine Sciences;
- Put in place the foundations for a long lasting integrative network in the marine research field: **EuroMarine+ (EM+)**.

1.3 The EuroMarine+ vision

EuroMarine+ will provide a rich and diverse source of the best expertise and innovation available in European Marine Research that can respond rapidly to societal needs, environmental demands, well-being and sustainability.

1.4 The EuroMarine+ mission: what does EuroMarine do and why does it exist?

EuroMarine+ will be a flexible, responsive organization able to assemble teams of dedicated marine scientists from around Europe (and beyond in emergent and developing countries). These teams will be able to address current and emerging issues and challenges in the marine domain. EuroMarine+ anticipates working closely with the Marine Board since this organization has a strong track record in providing assessments, identifying challenges and producing excellent vision documents that identify key areas for attention. EuroMarine+ also expects to work closely with the new Joint Programming Initiative "Healthy and Productive Seas and Oceans", as well as providing strategic information to national and international funding agencies taking into consideration the need for avoiding duplication and inducing competition. In this way, EuroMarine+ will play a key role in structuring and driving forward marine scientific research and technical development in Europe and globally. Such a network including world-class scientists from fields as diverse as genomics and physical oceanography will provide unique and innovative teams to ensure the sustainable development and exploitation of our fragile marine ecosystems, as well as to provide expert advice for environmental managers and policy makers.

Above all, EM+ will provide a real operational platform to ensure that bottom-up approaches in the marine field are well balanced and complementary to top-down existing structures and initiatives.

1.5 Overall EuroMarine+ objectives

EuroMarine+ will:

- Develop a roadmap for common programming of research activities;
- Create synergies between different scientific fields;
- Move towards an integrated research strategy and shared vision for the oceans of tomorrow, and;
- Facilitate the long-term integration of data, historical, present and future.

The goal is to exploit the knowledge generated by the network to address questions related to marine ecosystems and organisms and the societal needs. EuroMarine aims to support and promote 21st century marine scientists, with deep knowledge in one discipline and a basic "fluency" in several others, as well as a natural ability and desire to work as part of a multidisciplinary research team.

1.6 EuroMarine+ implementation process

EuroMarine+ will be established based on a Memorandum of Understanding (MoU) to be signed by the 17 beneficiaries of the FP7 CSA EuroMarine project. This MoU will be opened to signature to any Research Performing Organisations or Universities which were former members of FP6 marine NoEs.
The signature of the MoU will launch the negotiation of the Consortium Agreement which will inform on rights and rules of the network and will direct the establishment of a supporting legal entity.
Among its main priorities, EuroMarine aims at facilitating the process by providing scientific conferences, foresight workshops as well as common frameworks (e.g. European PhD programme in Marine Sciences) for the marine research community.

To achieve long-term integration, EuroMarine+ will consolidate its partnership using a simple, flexible and transparent legal solution to be adopted by all partners (mixed model using a consortium as the governing body and a legal entity as a support management unit).

1.7 EuroMarine+ research targets

Research targets during the operational phase will include:

1. ***Research and Research Infrastructure:*** to create an integrated yet flexible common strategic framework for identification of marine research and research infrastructure priorities, development and funding streams, particularly at the level of RPOs (Research Performing Organizations) and their funding partners.
2. ***Access to Infrastructure and Mobility:*** to enable cross fertilization and the best fit-for-purpose experimental protocols together with the development and application of state-of-the-art technologies.
3. ***Transfer of Knowledge****:* to develop new interdisciplinary education programs to train the next generation of marine scientists, a mobility scheme for doctoral candidates and post-docs. EuroMarine will transfer knowledge through cross-disciplinary web-based seminar series (Webinars), available also to colleagues in developing countries**.** EuroMarine will also sponsor summer schools and workshops including high-level training programmes for technicians and support staff essential for smooth operations and access to Infrastructure services.
4. ***Policy Advice Priorities:*** a much better proactive representation of the academic scientific community in policy and decision making at national and international levels will be promoted by creating and contributing to efficient Science-Policy Interfaces.
5. ***Information Priorities****:* to maintain our website (www.euromarineconsortium.eu) with features that include data acquisition, project information, job opportunities, an events calendar, a database of contacts, and a news section.

1.8 EuroMarine+ impact and added value

The impact of EuroMarine+ will be the improved utilization, development and management of European marine scientific research potential (above all Europe's scientists in academia), including increased shared use of expensive infrastructures at the European level (ships, experimental facilities, mesocosms, high tech instrumentation, databases etc), increased availability of data and the potential for creating integrated but flexible centers of learning, research and education at the highest international level taking into account mobility schemes.
These developments will ensure Europe to remain competitive at the leading edge in marine sciences worldwide. By bringing together the partners of the three major marine FP6 NoEs into a common network, EuroMarine+ will bring added value by promoting the development of new and innovative activities particularly in the "trading zones" between these former NoEs.
In this respect, EuroMarine+ will take a leading role in contributing to the IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) initiative and will contribute to current international programs (e.g. GEOBON of the Global Earth Observation initiative).

2. The EuroMarine+ positioning within the European marine and maritime research landscape

2.1 Overview (see list below)

The list of EU marine research planning, funding and performing initiatives, organisations and projects as presented here is not exhaustive as only key actors and main marine related initiatives of pan-European relevance have been included.
In order to avoid duplication, this list has been derived from the one developed by the EMAR2RES FP7 project (also used for the MARCOM+ FP7 project) and being updated.
For the sake of clarity and consistency, the main research activity performed (or the main area of geographical interests) by the organisations/initiatives are only mentioned.
Particular and/or possible types of interactions are also described in order to inform or suggest the potential EuroMarine+ strategic positioning in relation to other European networks, organisations and projects.

Two clusters of initiatives are listed below: **1) permanent** and **2) time limited** (projects) initiatives.

Name (initiatives, networks)	Legal status	Main activities	Sources of funding	Networking activities	Foreseeable interactions with EuroMarine+
Baltic organisations Network for Funding Science www.bonusportal.org	European Economic Interest Grouping (EEIG)	Implementation of joint RTD programmes	Framework programme and Members Organisations subscriptions	EATIP/AquaNet TT	Create synergies on research topics of common interests with relevance to the Baltic Sea area. External services: • Reduce imbalances among regions through human capacity building; • Enhance public awareness towards marine and maritime scientific and policy issues in Europe.
The Mediterranean Science Commission (CIESM) www.ciesm.org	Intergovernmental organisation	Marine research in the Mediterranean and Black Seas	Annual fees from governments	IOC, IAEA, UNEP, FAO, GESAMP, Waterborne TP, MARCOM+	Create synergies on research topics of common interests to the Mediterranean Sea area
Conference of Peripheral Maritime Regions (CPMR) www.cpmr.org	Non-profit organisation	Regional cooperation	Members Organisations subscriptions	European intergroup on sea and coastal affairs (European Parliament)	Enhance the role of marine research stations in structuring the regional dimension and enhancing economic development of peripheral regions, i.e. islands

Name (initiatives, networks)	Legal status	Main activities	Sources of funding	Networking activities	Foreseeable interactions with EuroMarine+
Eurocean http://www.eurocean.org	Organisation (network of RFOs/RPOs)	Information on Marine Science and Technology	Members Organisations subscriptions	AquaTT, European Marine Board	Create synergies on communication and dissemination
European Consortium for Ocean Research Drilling (ECORD) www.ecord.org	Organisation (network of RFOs/RPOs)	Ocean Drilling research	Members Organisations subscriptions	DS3F, IODP, NSF (US) etc.	Create synergies on research topics of common interests (ocean drilling)
EU Aquaculture Technology and InnovationPlatform (EATIP) www.eatip.org	Trust	Sustainable profitable value chain of competitive food products and imports	EU grant-aid and members organisations subscriptions	MARCOM+	Create synergies on research topics of common interests in aquaculture
European Aquaculture Society (EAS) www.easoline.org	International non-profit organisation	Sustainable development of EU Aquaculture	Members Organisations subscriptions	EATIP/AquaNet TT	Create synergies on research topics of common interests in aquaculture
European Fisheries and Aquaculture research Organisations (EFARO) www.efaro.eu	Organisation (network of RFOs/RPOs)	Fisheries and aquaculture policy	Members Organisations subscriptions	MARCOM+	Create synergies on research topics of common interests (Europe-wide fisheries and aquaculture)
European Institute of Technology (EIT): marine/maritime KIC www.eit.europa.eu	Body of the European Union	Ensure European growth and competitiveness	Community budget	JPI Oceans, EIP	Create synergies in the fields of education, innovation and research

Name (initiatives, networks)	Legal status	Main activities	Sources of funding	Networking activities	Foreseeable interactions with EuroMarine+
European Global Ocean Observing System (EuroGOOS) www.eurogoos.org	Organisation (network of RFOs/RPOs)	Operational oceanography	Members Organisations subscriptions	Regional GOOS, regional conventions …	Create synergies on research/infrastructure topics of common interests (ocean observation, European Seas)
European Marine Board (Marine Board-ESF) www.marineboard.eu	Organisation (network of RFOs/RPOs)	Marine research policy and strategy	Members Organisations subscriptions and EC project funding	EC Projects ICES EURO-GOOS Eurocean …	Develop complementarities and synergies on research topics of common interests (most EM+ topics of relevance)
European network of Marine Research Institutes and Stations (MARS) www.marsnetwork.org	Foundation (Dutch law)	Coastal marine research laboratories and institutes	Members Organisations subscriptions	EMBRC LIFEWATCH EMBOS MARCOM+ …	Develop complementarities and synergies on research topics (strong overlap in membership, synergies in selected topics expected). Future forms of cooperation will have to be designed.
International Council for the Exploration of the Sea www.ices.dk	Intergovernmental organisation	Marine sciences, fisheries	Annual fees from governments, FP projects	MARCOM+, data management networks, Waterborne TP, European marine Board, EFARO …	Create synergies on research topics of common interests

Name (initiatives, networks)	Legal status	Main activities	Sources of funding	Networking activities	Foreseeable interactions with EuroMarine+
Intergovernmental oceanographic Commission of UNESCO – International oceanographic Data and Information Exchange (IODE) programme www.iode.org	International organisation	Facilitate the exchange of oceanographic data and information and meet the needs of users for data and information products	UNESCO and IOC member states contributions	SEADATANET, EMODNET WISE marine …	Create synergies on research topics of common interests (data management)
JPI Oceans "Healthy and Productive Seas and Oceans" http://www.jpi-oceans.eu	Joint Programming Initiative	Coordinating and integrating long-term platform, open to all EU Member States and Associated Countries who invest in marine and maritime research.	Several members contributions (cash and in kind), EC money (CSA Oceans)	SEAS-ERA, EATIP, Waterborne TP, CIESM, BONUS, ICES, Marine Board-ESF, other JPIs …	Create synergies on research topics of common interests

Name (projects)	Legal status	Main activities	Sources of funding	Networking activities	Foreseeable interactions with EuroMarine+
EMAR2RES www.emar2res.eu	FP7 Project (2009-2012)	Initiate cooperation between the communities of European MARine and MARitime REsearch and Science	EC funds	MARCOM+, European Marine Board, Waterborne TP	Create synergies on research topics of common interests, eg. Aliens species, Arctic ice melt, marine mammal biology (acoustics), act as Science-Policy Interface
EMSAC (to become REMCoP) European Marine Science Application Consortium http://www.emsacnet.eu	FP7 project 10 partners from France, UK & Sweden including Clusters, universities & regional authorities.	The project will: . strengthen the need to foster marine science research within the EU . increase research capacity throw an active participation of marine Clusters.	EC funds	New collaborations will be set up at EU & international level including the emergence of new clusters.	Create synergies on research topics of common interests in: Water quality Environmental risks Sustainable living resources
ERA-NET Marine Biotech http://www.marinebiotech.eu/	FP7 coordinating action: ERA-NET preparatory action on marine biotechnologies	Prepare the foundation for an ERA-NET in the area of marine biotechnology	EC funds	SEAS-ERA, EMBRC	Develop complementarities and synergies in marine biotechnologies
MARCOM+ http://www.marinemaritimescienceforum.eu	FP7 project (2009-2012)	Towards the creation and development of a long-term and self-sustaining "European Marine and Maritime" Science and Technology Forum	EC funds, prolongation with own funds (membership fees)	EMAR2RES, SEAS-ERA	Create synergies on research topics of common interests External service: Guiding the implementation of the European Strategy for Marine and Maritime Research.

Marine Infrastructure research projects and initiatives (EURO-ARGO, EMBRC, EMSO, EUROFLEETS 2 etc.)	FP7 Projects (I3) ERIC legal status	European marine research infrastructures	EC and member states funds	(Future) European Ocean Observing System (EOOS)	Create synergies on research topics related to networks of existing or emerging novel marine research infrastructure (i.e. ships, data and resource centres, observing platforms etc.)
SPIRAL **http://www.spiral-project.eu** **Biodiversity knowledge** **http://www.biodiversityknowledge.eu/**	FP7 projects	Biodiversity, science/policy interface	EC funds	IPBES	Develop complementarities and synergies on linking marine biodiversity issues and policy challenges. External service: opportunity for main policy actors and stakeholders in biodiversity science-policy interfaces to learn, share experiences and network.

From the table above, it can be noticed that EuroMarine+ is not alone in promoting greater collaboratio
- Within the European marine research landscape;
- Between marine and maritime research and policies, industry and service sectors.

Nevertheless, EM+ is unique in its broad coverage of almost all relevant disciplines over most Europe countries. It will provide to small players in the marine realm, the visibility, opportunities and tools to:
- Develop an innovative RTD&I strategy for marine research in the 21st Century;
- Interact closely and on eye-level with permanent science-policy organisations and initiatives of hi standing, but mostly limited to one or a few topical or regional fields;
- Provide input into development of novel services and products, including for outreach, resear infrastructure and capacity enhancement;

EM+ is therefore needed as a bottom-up organisation: it will secure close links with marine and maritir researchers and will provide new and challenging perspectives to multidisciplinary research teams a young marine researchers. EM+ will also enhance the link between education and training entrepreneurial-minded scientists with a view to provide new services and products based on a thorou understanding of the marine environment.

2.2 The EuroMarine+ niche

The impact of EuroMarine+ will be to improve the utilization, development and management of Europe marine research potential (including the shared use of expensive infrastructures), data availability and foster the creation of integrated centres of learning, research and education at the highest level. This v ensure Europe to remain competitive and at the leading edge in marine sciences worldwide. By providi a common shared platform for existing core activities of the three NoEs, EuroMarine+ will also bri added value by promoting new and innovative activities in the "trading zones" between the three form NoEs and of their ongoing structures.
EM+ plans to become a major internationally competitive network of research performing organisatic and universities (RPOs), covering a broader scope than the three NoEs and Marine ESFRI projects (EMBF EUR-ARGO and EMSO) together. It is the only European body representing the interests of the many sm marine and inland biology labs in universities which require a joint platform to be able to integrate th manifold interests and to put these forward to European and intergovernmental policy makers a funding bodies.
EM+ sees its Unique Selling Point or niche in the fields of:
- Identifying and where feasible addressing the new scientific challenges for marine sciences through jo research programming (research strategy & roadmap);
- Building and enhancing capacity through linking the further development of research infrastructure a cross-disciplinary training (PhD school);
- Starting with promoting successful examples of sharing of scientific facilities and mobility of personnel;
- Developing novel products and services generated from projects, maintained by EM+ in the long-ter and embedded in a joint programming strategy (EU policy, IPBES, GEO-BON, ESFRI projects like LifeWat EMBRC, EMSO, Euro-ARGO etc);
- Developing databases through the engagement of the European marine data management and scienti communities involved in long-term data integration and technological developments.

3. EuroMarine+ products and services

The **EuroMarine FP7 project** has identified four main integrative sectors in which EuroMarine+ key activities strive to generate a significant added value in terms of providing products and services for the benefits of the European marine and maritime research communities:

- EM+ Services for the Science-Policy Interface;
- EM+ Infrastructure Services including Scientific Data;
- EM+ Training and Education Services; and
- EM+ Provision of Expertise Services and Products.

For sake of clarify and consistency, each of these integrating activities are developed in different sections and along the same format:

- Strategic objectives;
- Implementation of key activities;
- Type of desired products with potential clients;
- Incurred costs;

At the end of each section, the tables summarise the key elements of each activity along with a SWOT analysis. Cost overviews are presented in Chapter 3.5.

3.1 EuroMarine+ and its Services for the Science-Policy Interface.

3.1.1 Strategic objectives

The objectives are:
- To develop a roadmap for common programming of research activities;
- To create synergies between different scientific fields;
- To move towards an integrated research strategy and shared vision for the “Oceans of Tomorrow”.

EM+ goal is to achieve a proactive representation of the academic scientific community in policy and decision making processes at national and international levels. This will be promoted and enhanced through the delivery of specific EM+ priorities and results to existing Science-Policy Interfaces.

3.1.2 Description of key activities

Several key activities are planned based on positive experiences from NoEs and affiliated bodies.

3.1.2.1 Foresight workshops

Foresight/exploratory Workshops (FWS) are envisaged in the first phase of EM+ focussing on zones of overlapping interest between the three NoE, the **"trading zones"**. The organisation of those workshops (whether they will be on topical or geographical basis) should demonstrate clear complementarities with the ones being regularly organised by the European Marine Board; in some cases, some workshops can be set-up jointly.

- *Type of activity & desired products*
Activities will be implemented through specific calls for proposals for short-term focused workshops with around 15 participants with strong scientific background. Products will be workshop reports which may contain specific roadmaps or scientific articles. Mid-term outputs could generate thematic networks and/or longer-term plans for EU-wide or regional projects.

- *Clients*
Scientists, programme managers, policy makers, marine/maritime stakeholders.

- *Foreseen occurrence and incurred costs*
Resources allowing, at least three to four Workshops per year are planned, covering initially topics within the 6 emerging fields that EuroMarine has identified in the trading zones.
A typical budget for one workshop with 15 people is 15k€. Therefore the budget for the six planned in phase 1 is 90k€, ideally to be spent during the first 18 month of EM+.
The budget is intended to fund full participation of important stakeholders. One option to consider is to draw complementary external funds (e.g. in conjunction with other bodies as the European Marine Board).
In the first phase (see Action Plan 4.1) calls for funding workshops should be made every twelve months to increase EM+ visibility and to inform future Horizon 2020 calls and pilot calls in the frame of ERA-NETs and JPI OCEANS.

3.1.2.2 Flagship programmes

- *Type of activity & desired products*
These are small research programmes on emerging marine issues of high relevance. They will try to demonstrate the potential usefulness of new jointly developed research approaches, which are not yet on any funding agendas, but are considered of strategic importance. This approach was successfully used in MGE funding interdisciplinary collaborative teams in performing innovative genomic research. More recently, it was also successfully used in the EUR-OCEANS Consortium, in conjunction with foresight workshops and conferences, to address oceans deoxygenation, impact of mesoscale processes on ecosystems functioning, and rapid change in polar ecosystems.

- *Implementation*
A lot of flexibility is foreseen for this funding scheme. Details will be defined in the programme (e.g., to fully or partially fund one ore several post-doc(s), some exchange of staff to enhance interdisciplinarity, and work on issues of strategic importance). Possible products are publications, which if presented

correctly, should lead to opening policy makers and other marine & maritime stakeholders to support novel avenues of research and education on a larger scale.
Flagships are not foreseen in the initial phase, unless enough funding is available, as they need more substantial funding and more preparation than workshops.

- *Foreseen occurrence and incurred costs*
A Budget of 55k€ per year and for 1 or 2 years duration is initially envisaged (e.g. to fully fund a 2-year post-doc). This budget could be increased (e.g. through in kind contributions) to set-up a small team which would be dedicated to deepen the knowledge in a particular research field.

3.1.2.3 EuroMarine+ conferences

- *Type of activity & desired products*
High level conferences (e.g. general assembly) would provide visibility to EM+ strategies and recent achievements. The co-funding (European and foreign) of a conference might also raise EM+ outputs and impacts at a more global level. A first conference to launch the new EM+ structure will be a good means to enhance EM+ visibility and to reach and attract a larger membership.

Some conferences can be organised as the Gordon-like Conferences which usually are more scientifically focussed and aim to support the participation of young scientists with the objective to commonly address new scientific challenges and to design new types of collaborative programs (e.g. flagship programs).

- *Implementation, foreseen occurrence and incurred costs*
A budget of 30 k€ is planned which could be complemented by other sources (i.e. national, European or international co-funding).
If possible one high-level conference should launch EM+. Thereafter, maximum one conference per year is envisaged during the second and third phases of EM+.

3.1.2.4 Science plans and strategies

- *Type of activity & desired products*
This activity will entail a mechanism to discuss research priorities and programmes from members in order to establish common goals and priorities and communicate those to main funding agencies and policy makers.

- *Clients*
National marine funding agencies;
Joint Programming Initiative “Healthy and Productive Oceans”;
ERA-NETS;
Future Earth (Belmont Forum);
IPBES ;
European Environment Agency and JRC ;
ICES, CIESM and European Marine Board.

- *Implementation, foreseen occurrence and incurred costs*
This will be done by working groups (WG), who might have their starting phase during the workshops described under 3.1.2.1 but with the aim to continue their work until a science plan is ready as a final product. The topical areas can be chosen as a response to solicitation by other bodies, or at own EM

initiative, which then would start with the "trading zones". The European Marine Board and ICES are envisaged as key players to ensure cooperation, synergies, complementarities on topics of common interest.
Each group will hold at least one annual meeting besides the starting workshop, with 5k€ budgeted per meeting. They are open to all members, with a view to produce policy reports in a time efficient manner. Therefore, several smaller and time-limited WGs could be envisaged to ensure flexibility. This activity will start in the first phase and WGs will continue, depending on their aims and outputs during the second phase.

3.1.2.5 Additional information
Only members can lead such an activity or programme of activities. As far as participation is concerned, a principle of priority for members should be observed. Key external participants from outside EM+/Europe could be invited if needed.
Competitive calls and, if deemed necessary, the activity areas per call with other details will be fixed by the EM+ Governing Board in accordance with the legal framework.

3.1.3 – Overview of activities and SWOT analysis

Overview of activities	
1) Foresight Workshops	
Implementation of key activities	Set-up foresight/exploratory workshops on zones of overlapping interests (= trading zones). Implement procedures to launch dedicated calls for experts participation. Scientific focussed.
Type of tools (1) and desired products (2)	1) Workshops; 2) Reports, scientific articles, thematic networks, recommendations/statements;
Clients	Scientific community, programme managers, policy makers, marine and maritime stakeholders
2) Flagship Programmes	
Implementation of key activities	Elaborate scientific programmes on emerging marine issues
Type of tools (1) and desired products (2)	1) programme activities; post-docs, small teams 2) meetings, conferences and summer schools, publications
Clients	Scientific community, programme managers, policy makers, marine and maritime stakeholders
3) Conferences	
Implementation of key activities	Organise research conferences
Type of tools (1) and desired products (2)	1) Conferences 2) Proceedings
Clients	Scientific community, programme managers, policy makers, marine and maritime stakeholders
4) Alignment of Science Plans and Strategies	

Implementation of key activities	Align EM+ research priorities and affiliated programmes in order to establish future common goals and priorities. Disseminate those priorities to key EU and international marine and maritime stakeholders. Policy focused.
Type of tools (1) and desired products (2)	1) Working Groups; 2) Working Groups strategic reports;
Clients	Members, Science/policy interfaces (IPBES, IPCC), European Commission
SWOT analysis over these four activity sets	
Strengths	Capacity to mobilise critical mass of marine experts; High level expertise over all marine disciplines is available; Capacity to identify "hot/emerging" topics, to explore and convey them through a bottom-up process to programme managers, policy makers and stakeholders; Capacity to build coordinated approach among various disciplines to address complex questions; Proven potential of Gordon-like conferences; Huge experience on broad field of marine sciences;
Weaknesses	Breadth of coverage or activities and number of topics addressed limited by self-funding capacity (unless complementary funds are secured for this type of activity); Lack (or poor representation) of economic and social sciences within EM+ (need to liaise with or attract them); Insufficient number of cross-disciplinary links to address larger system-based questions; Difficulty in maintaining long-term collaboration due to different funding cycles and fragmented nature of funding calls that may exclude key areas for consideration; Need to complement own funds with other sources;
Opportunities	Increased expectation for scientific advice from policy-makers and stakeholders in a context of rapid climate and global change, biodiversity and ecosystem services loss, marine data &knowledge for sustainable development e.g. marine renewable or marine-derived biotech; Launch of the IPBES; Enhance visibility to stakeholders and end-users through the consolidation of all elements on important issues in reports (position papers) that may advertise and promote EM+ abilities and competencies to deal with specific issues; Opportunity to raise emerging issues;
Threats	Risk of insufficient communication or coordination with other bodies and stakeholders Risk of low interest from social sciences for a coordinated approach on topical marine issues Current trend is towards short-term economic gains at the expense of fundamental research resources which are needed to feed long-term,

	innovation pipelines. Insufficient tuning (communication and/or joint coordination) of similar activities between EM+ and other actions and networks as EMBRC, European Marine Board etc.

3.2 EuroMarine+ and infrastructure services including scientific data

3.2.1 Strategic objectives

Link fundamental research to societal priority areas (food, energy, environment, health, industry), recognizing that fundamental research is essential to the "applied-pipeline";
Foster appreciation, linkages and respect between fundamental and applied research trajectories;
Create the distributed infrastructure necessary among universities and institutes that will allow next-generation scientists to participate in interdisciplinary projects.

3.2.2 Description of key activities

3.2.2.1 Provide Information for scientific purposes

During the starting phase, EM+ will proceed with the collation of information on infrastructures and observing systems (protocols, stats, best practices, metadata) for scientists which has been initiated during the project phase, and disseminate the results through publications, website and other means.
This will be mainly reached through the organisation of workshops with the aim:
- to gather / and harmonise the information;
- to increase the shared use of facilities and observatories (promotion, dissemination of information).

3.2.2.2 Provide information for operational purposes

EM+ will further stimulate the development and support the development an observation system and of specific services such as the development of monitoring strategies in the frame of MSFD implementation, and other management schemes, through the support of EMBOS (Development and implementation of a pan-European Marine Biodiversity Observatory System). This key action is targeting Scientists, Policy makers and regulatory authorities.

3.2.2.3 Future looks for marine RIs

Foresights are needed to improve and sustain user access to the broad range of marine infrastructures.

3.2.3 Necessary conditions for implementation

Workshops and conferences will be organised.
Results dissemination will be done through targeted publications and the website.

3.2.4 Clients

Scientific community (scientists and managers)
Policy makers (science plans)

3.2.5 Overview Tables

Marine Research Infrastructures	
1st activity: provide relevant information for scientific purposes and applications	
Implementation of key activities	Collate information from research infrastructures and observing systems for the scientific community (protocols, statistics, best practices)
Type of tools (1) and desired products (2)	1) Workshops 2) Reports with key recommendations
Clients	Scientific community (scientists and managers)
SWOT	
Strengths	EuroMarine represents the wider European scientific community regarding spatial coverage (all Europe) and science discipline
Weaknesses	Lack of funding for practical implementation
Opportunities	Strengthen and tune interactions with EMBRC, SEAS-ERA, EurOcean, Eurofleets, EMBOS, etc. EM+ would provide experts for all infrastructure projects (= being part of Reference User Groups (RUGs)). EM+ community will use these infrastructures and effective tools must be therefore implemented to ensure good and long-term interactions with project managers.
Threats	Avoid duplication with other projects;

Marine Research Infrastructures	
2nd activity: provide information for operational purposes and applications	
Implementation of key activities	To develop/support specific services such as the development of monitoring programs in the frame of MSFD implementation
Type of tools (1) and desired products (2)	1) Organisation of topical workshops 2) Workshops reports (monitoring methods, guidance etc.)
Clients	Policy makers and regulatory authorities
SWOT	
Strength	Wide coverage of the marine realm (from coastal to deep blue) all over Europe for all relevant science disciplines
Weakness	Lack of funding for practical implementation
Opportunities	Better link with MSFD EC technical groups
Threat	Overlap with ongoing activities of EMBRC, EMBOS. No commitment at policy and political level regarding the fundamental scientific aspects (only minimal attention to the direct applied aspects)

Marine Research Infrastructures	
3rd activity: future looks for MRIs	
Implementation of key activities	Foresight studies for the sustainability and suitable use of MRIs

Type of tools (1) and desired products (2)	1) Organisation of a research conference on MRIs, ideally back to back with another event in marine science policy (eg. Eurocean conference series, EU Maritime days, Seatech week) 2) Proceedings, statements
Clients	Policy makers
SWOT	
Strength	Relevant expertise available among members
Weakness	Pulling attention from stakeholders at policy and industrial level
Opportunities	Links with SEAS-ERA, Joint Programming Initiative Oceans, European Marine Board, ESFRI
Threat	Duplication with on-going initiatives (e.g. European Marine Board fora series)

Data	
Data integration	
Implementation of key activities	Address specific issues and challenges related to data management across disciplines, from genes to ecosystems. Challenges include linking data when they are generated, data interoperability and integration, dissemination, and linking data to scientific output (e.g. publications).
Type of activities (1) and desired products (2)	(1) Workshops comprising scientists and data managers who develop conceptual and technological solutions; (2) Stand-alone and web-based integration tools/services
Clients	Scientific Community
SWOT	
Strength	Partners (at minimum VLIZ, MPI-MM and UniHB) bring a global view and connections to (1) most marine data management initiatives in Europe and internationally; (2) data integration in marine research initiatives across the domain of EuroMarine (i.e. from genes to ecosystems), including hind cast and forecast modelling, monitoring, and data dissemination to support the MSFD.
Weakness	No additional funding to carry out activities outside the workshops; relies on partners' own funding and funds from other initiatives.
Opportunities	Engage close interactions with data infrastructures and service providers (Seadatanet, EMODNet, MyOcean, OGC, EMBRC, ELIXIR)
Threat	Missing incentives for individual researcher/institute/university to (1) apply standards developed for data acquisition/storage/processing ; (2) make data publicly available; (3) resolve IPR issues in EEZ

3.3 EM+ and Training and Education Services

3.3.1 Strategic objectives

- Maintain "one stop shopping" for MSc and PhD degree programmes on the EM+ database and provide ongoing analysis of new course needs;
- Reconfigure graduate programmes in order to better integrate organism and process/modeling approaches from genes to ecosystems thereby implementing a genuine systems approach via: courses, exchange fellowships and a multi-track PhD programme that complements advanced trainings/summer schools/workshops in marine sciences.

The EuroMarine network has critical mass, as the three founding NoEs include the necessary level of expertise, visibility and willingness to cooperate. This has been demonstrated especially in the field of training and education as shown over the last decade. The Euromarine network represents ~75% of marine science degree programs in Europe and thus has access to the majority of degree students.
A focus of the EM+ training planned will be on providing greater flexibility among universities to develop joint-degree programmes targeting high European added value. This will help phase in the necessary shift to strengthen quantitative and system approaches in combination with more descriptive / analytical / experimental approaches.
On the medium to long-term, mobility schemes will continue to be developed and refined in close cooperation with joint infrastructure usage (e.g., a PhD school with the nascent EMBRC).
In the medium to longer-term it is planned to develop a multi-stream PhD programme in marine sciences with the help of EU support (e.g., ITN, Erasmus Mundus, JPI Oceans).

3.3.2 Key activities

3.3.2.1 Further refinement and upgrading of MSc and PhD programme database by the EM office
One-stop shopping for degree programs is a central activity of Euromarine in collaboration with JPI-Oceans, EMBRC and others. This could be planned in conjunction with staff to maintain the website service described elsewhere
Also during the start-up phase, we need to discuss and decide in more concrete terms about how to proceed with a proposal for a multi-streamed PhD programme involving genomics, advanced climate/ecosystem modeling and systems ecology. As this is a complex endeavour, the first year of EM+ would be needed to work on it.

3.3.2.2 Developing plan and pre-proposal for a multi-track PhD degree program
Through at least two workshops, we will develop the curricula and trajectories for a multi-stream PhD programme designed to meet the challenges enumerated in the Euromarine Research Vision document.
These tentatively include:

- Marine systems biology with emphasis on -omics approaches (ecosystem function, blue biotech);
- Modeling (combining climate, ocean circulation, ecological (e.g., trait-based);
- Marine biodiversity (IPBES link) to include observatories, eco/bioinformatics, total marine coverage (deep sea, seamounts, sub-seafloor, etc.).

The transdisciplinary link to each of the tracks above would include economics of ecosystem services and sustainability, interfacing with society, working with the media, etc. Attention will be paid to the "trading zone" areas in which students can particularly benefit. We will formalize coordination and core partners.

The extension of the Erasmus Mundus PhD programme MARES at Univ. Ghent and a possible greater integration of EM+ will be discussed in the second workshop.
As output a first ITN proposal and plans for the other streams are envisaged for 2014, thus it will be written and submitted in the second phase. The implementation is planned for the third phase, as it is dependent on external funding.

3.3.2.3 Establishment of multi-level mobility and course programmes for specific competency training
There are two levels of key activities here:

- already "branded" flagship workshops and summer courses;
- continuation of EuroMarine Fellowships of 1-2 months for PhDs, post-docs, technical/support staff, senior researchers.

Most of the training courses will be related to the joint infrastructure activities, so specific competency can be obtained. This typically involves wet-lab workshops, access and training to state-of-the-art research infrastructure (e.g., specialized instrumentation), data management, modeling software). It is in this area that a Khan School approach could be considered if there is an appropriate business partner. AquaTT net could also be involved.
In addition to the 2-3 flagship (summer) courses that will be run each year for 2 weeks (more theory and problem solving oriented), specific topical training courses of ca. 1 week will also be developed as needed (e.g. modeling biodiversity, standardized sampling and statistics in specific areas). Topical trainings are also planned in the framework of the eventual PhD programme (see below).
Short-term stays can be funded with internal means in some cases or directly by the members if the overall organization is set up and maintained by EM+ staff. Further external funding will, however, be necessary to sustain one-time courses as well as the fellowships programme at an appropriate level. Know-how with respect to courses and fellowships are already well-established within Euromarine.

3.3.2.4 European PhD programme in Marine Sciences
There are two instruments to be considered:
- an Marie Curie-ITN proposal (focused on a European PhD school with exchange of PhD students);
- an *Erasmus Mundus* for all proposal for a multi-track PhD-degree programme (details of EM4All not yet known).

The ITN approach is the most minimally ambitious and would necessarily restrict the scope of the programme. The planning workshops would ensure that that the ITN track would connect to several aspects of the EM+ Vision across marine disciplines with a focus on the trading zones. .
In contrast, the EM4All, is the most ambitious project and will depend on a coordinated effort among EM+ partners, as well as between EM+ and other H2020 programmes, e.g., EMBRC, JPI-Oceans. Here we envisage 3-4 major tracks involving a total of ca. 50 PhD students spread over the entire EuroMarine range of marine sciences. Such a program is unprecedented and would require exceptional support from the EU and from member states. Nevertheless, such a programme would genuinely integrate the educational component in the spirit of EM+ and the H2020 vision.

3.3.3 Clients

They will come mainly (but not exclusively limited to) from the membership, I.e. the marine scientific community. Offering access to training schemes can also be used to attract new members into the EM+ partnership. For example, part of a training course fee, i.e. for the summer school, could flow into a trial membership for one year.

3.3.4 Cooperation, synergies and complementarities

Cooperation is mainly foreseen in relation to the infrastructure component. Synergies with existing training and education partnerships will be instrumental for the starting phase. Here, the funding is still minor so that already planned training modules can be utilized as pilots for making broader contacts to (e.g. via CoFund or within the many existing bilateral cooperation schemes). EM+ will use these opportunities to explore topics and formats for which high demand exists. Only then it is worthwhile to develop training activities on a more permanent and European level.

Open Access can also play a key role by increasing visibility and impact of EM+ and its members. On-line learning, such as the Khan-Academy approach (or similar) needs to be explored in a business framework.

An ongoing analysis of Training needs will be part of the EM+ Educational Office and will extend to ERA-Nets and large EC projects (e.g. Elixir, MicroB3). The analysis will further determine whether the prospective course will create synergies or complementarities and can be built upon. In the future, ESFRI initiatives can be integrated into the planning as potential hosts.

3.3.5 Foreseen occurrence and incurred costs including necessary conditions for implementation

For the first phase, - i.e. offering access to short courses planned by single members, and mutual exchange of staff - in kind contributions may suffice so no explicit funding is needed. For planning of a major EU proposal (ITN or EM4All), some funding will be required to support the application (10k€ Euro per proposal)

For novel courses open to all members a call for organising training courses on specific topics will be prepared in the second phase, with 10k€/15k€ available per 1-week/2-week course to the organizer to recover extra costs.

For the exchange fellowship program a maximum duration of 2 months is envisaged with funding of

- 2k€ for the student (1000/month)
- 500€ for the hosting university/ institute per month.

Initially 10 – 15 positions, depending on the duration of the stay, will be offered. Ideally it would be good to be able to offer and support 25 fellowships per year, some of which could be funded within the larger proposals.

Overview of Training-Related Activities	
Implementation of key activities	1. Refinement and upgrading of MSc and PhD degree programmes including ongoing analysis of new course needs 2. Developing curriculum structure and pre-proposal for a multi-track PhD degree programme 3. Establish a multi-level mobility program that includes: summer courses and competency training; and an exchange fellowship programme (the latter covering PhD, post-doc, technical and senior research personnel) 4. Establishing a multi-track European PhD programme in Marine Sciences
Type of tools and desired products	1. EM+ Office; leading to active database/web services, active communication in planning of new courses, locations etc. 2. Workshop(s) leading to formal proposal in 2014 call and for support to an active mobility programme 3. EM+ Office assistance leading to an active mobility programme 4. Educational development team. Reports, scientific articles, thematic networks, recommendations/statements for European and regional projects;

Clients	Scientific community, selected stakeholders like curricula developers and funders, RI access providers
SWOT analysis over the four T&E activities	
Strengths	Capacity to mobilise critical mass of marine experts; High level of expertise over all marine disciplines available; Capacity to identify 'hot'/emerging topics, to explore their application in training & education Capacity to build coordinated approach among various disciplines to address complex questions Euromarine consortium represents ~75% of marine science degree programs in Europe
Weaknesses	Breadth of coverage or activities and number of topics addressed limited by self-funding capacity (unless funds are secured for this type of activity); Practicalities of how to coordinate funding, quality assurance which encounter many legal obstacles in different countries; Difficulty in maintaining long-term collaboration due to different funding cycles and fragmented nature of funding calls that may exclude key areas for consideration; The oft-requirement to complement own funds with other sources which vary greatly among institutes thus risking loss of key "small" participants and organizers.
Opportunities	Establishment of a fully comprehensive marine sciences graduate education programme for Europe that creates the new generation marine scientist (informed, transdisciplinary, grand challenge oriented to participate in team science)
Threats	Institutional barriers to European PhD degrees lack of timely coordination of funding Funding cuts for fundamental research that directly affects education Instability of funding mechanisms between universities and EU Overlap with ongoing activities of EMBRC, EMBOS. No commitment at policy and political level regarding the fundamental scientific aspects (only minimal attention to the direct applied aspects)

3.4 EM+ and provision of expertise services and products, including dissemination

Scientific expertise consists in providing the best available knowledge in response to a request made by policy-makers, in order to ensure that the decision choices will be based on sound and updated science. The goal of scientific expertise is about stating what is commonly agreed and accepted but also what is unknown, uncertain and controversial.
The issues dealt with by EM+ scientific expertise will have to be socially important, complex and require multidisciplinary approaches which should associate a wide range of ecology and social sciences.

EM+ will be mobilized to analyze international data and literature dealing with the issues of expertise. It will highlight the different options for action with their advantages and limits. In this perspective, EM+ will

play a key role in building up the expertise needed for dealing with specific IPBES enquiries on topical marine issues.

EM+ pool of expertise will enable to collectively address questions of different time/geographical scales and scientific knowledge. The need for flexibility in scientific priorities implies that membership itself must be flexible – with the capacity for new partners to join and existing partners to leave as science priorities evolve.

Dissemination & Outreach	
Implementation of key activities	- Coordination of activities; - Development of Web services; - Creation of Outreach materials: editorial activities, videos/films, newsletters etc; - Networking activities with other communications departments; - Organisations of meetings and events: a) Scientific conference (every 2/3 years) on key findings b) Communication workshops (one/year) c) General Assembly
Type of tools (1) and desired products (2)	1) Workshops to the communication strategy; 2) Listing and edition of case stories, news, fact sheets;
Clients	Scientific Community, EuroMarine+ members
SWOT analysis over the Dissemination and Outreach activities	
Strengths	Scientific excellence (publication in peer reviewed publications)
Weaknesses	Suboptimal communication among broad disciplinary domains
Opportunities	Improved communication tools for raising public awareness and influence policy decision making Strengthen synergies with European Marine Board, Eurocean portal, ASLO; Mobilization of different expertise in the marine realm to stimulate the debate and further consolidate some partnerships;
Threats	Lack of independence and risk of conflicts of interests (selection of experts)

3.5 Costs implied for each EuroMarine+ integrating activities (indicative full costs)

Costs for "Science-Policy Interface"	
Foresight Workshops	
Unit Cost 15k€ for one WS (15 participants)	
Minimum occurrence 3 yearly Total = 45k€/year	Optimum occurrence 6 (during implementation phase), then 4 yearly Total =90k€ then 60k€/year
Option: complementary external co-funding	
Flagship Programmes	
Unit Cost 55k€ for one programme Operational programme for maximum 2 years	
Minimum occurrence One per year Total = 55k€/year	Optimum occurrence Three per year Total = 165k€/year
Option : interested members to provide in-kind funding for their teams	
Conferences (incl. General Assembly and/or other scientific conferences)	
Unit Cost 30k€ (100 pers.)	
Minimum occurrence (General Assembly) One/year Total = 30k€/year	Optimum occurrence (GA + scientific conference) two/year Total = 60k€/year
Option: complementary external co-funding	
Alignment of Science Plans and Strategies	
Unit Cost 5k€ per Working Group (for 5-10 people)	
Minimum occurrence Three WG per year Total = 15k€/year	Optimum occurrence Six WG per year Total = 30k€/year
Option: Complementary external co-funding	
Total "Science-Policy Interface"	
Minimum scenario **145k€/year**	Optimum scenario **345k€/year**

Costs for "MRI & Data"	
Working Groups for MRI activities 1&2	
Unit Cost 10k€ for one WG (10 scientists and managers)	
Minimum occurrence two per year Total = 20k€/year	Optimum occurrence 4/year Total =40k€/year
Option: the EuroMarine+ leader in charge of infrastructures will manage this activity	

MRI conference: could be funded through the flagship program (competitive application procedure)	
Data integration	
Unit Cost 10k€ for one Workshop (10-15 participants)	
Minimum occurrence Two per year Total = 20k€/year	Optimum occurrence 4/year Total = 40k€/year
Only members contributing more than 5 k€ to the EuroMarine+ consortium can present a proposal	
Total "MRI and data"	
Minimum scenario **40k€/year**	Optimum scenario **80k€/year**

Costs for "Training & Education"
Refinement and upgrading of MSc and PhD programme database by the EM office
Part of salary for office staff, approx 15k€ per year
Developing plan and pre-proposal for a multi-track PhD degree program
15k€ for planning WS (15 participants) Two workshops planned in first 18 months, leading (with writing support of approx 10k€) to the formal proposal in 2014 call
Establishment of multi-level mobility and course programmes for specific competency training
Part of salary for office staff, approx 15k€ per year (as for activity 1) Flagship courses (funding from 4.1 flagships)= 15 k€ 1 week courses: 10k€ 1-2 months fellowships, preferentially at research infrastructures of relevance to EM+: 2500 k€ per fellowship of two months duration, less for 1 month
European PhD programme, training networks in Marine Sciences
Tools: Full ITN, full Erasmus Mundus PhD school Costs: 3.5 Mio Euro for 11 PhD over three years (mean value for ITN, runtime 48 months, maximum 500 person months funded)
Total key activities

Minimum scenario 3 activities (i.e. course and/or 10 fellowships of 1-month yearly in second phase and/or repeat of EM+ branded 2-week course) **Total = 40k€/year**	Optimum scenario 3 flagship or branded repeat courses =45k€; 5 smaller courses=50k€; 25 fellowships x 2500= 62.5k€ **Total = 152.5k€/year**
Option: external co-funding needed for regular repetitions of optimum number of courses and for PhD schools	

Costs for "Coordination/Dissemination"
Costs foreseen to employ 1 full time employee for managing overall EM+ coordination activities (including dissemination): 80k€/y Web services: several options, between "free of charge" to roughly 500-1000€/month (6k-12k/year);

Printing costs and other services (videos etc.): 10k€/y Communication workshops: 6k€/year	
Total key activities	
Minimum scenario (Salary, web) **Total = 92k€/year**	Optimum scenario (all services mentioned above) **Total = 108k€/year**
Option: Salary costs engaged for the coordinating person may vary	

3.6 Financial table: summary

EuroMarine+ integrating activities	Minimum scenario (k€/year)	Optimum scenario (k€/year)
Science-Policy Interface	145	345
MRI & Data	40	80
Training & Education	40	152.5
Overall coordination activities (incl. Dissemination)	92	108
Total	**317**	**685,5**

3.7 Budget and membership predictions

Below are two estimations, minimum and optimum, for a future EM+ budget needed to perform planned EM+ activities.

This calculation has been made possible using facts and figures extracted from the EUR-OCEANS Consortium (EOC) and MarBEF documents [1] [2].

To summarise the experiences with EOC and MarBEF to date, conditions could be assumed that:

1) Nearly 34% of initial NoE members are able to maintain their involvement in the overarching initiative EM+ and will financially contribute more than 5k€;
2) Small and medium entities (roughly < 75 people) can also provide small fee contributions which can range from 500€ (<25) to 1k€ (between 25-75) and 5k€ (>75); clear criteria will have to be fixed for this tiered procedure;
3) In kind contributions are possible although they should remain the exception: roughly 13% of initial NoE members were able to provide in kind contributions (EOC). Such contributions would need to be: (a) clearly specified, actually relevant to EM+ activities, truly open to all EM+ members, and assessable ex ante; (b) formally submitted to the EM+ secretariat in December of the preceding year; (c) approved by the Steering Committee;

[1] Membership of the EUR-OCEANS Consortium (revised 27/11/12)
[2] MarBEF Description of Work, 2005

To estimate a minimum and an optimum budget scenario, those conditions have been applied to the EM+ case.

Minimum scenario

EM+ can gather approximately **121 members** by encompassing all EUR-OCEANS, MGE and Marbef NoEs members. This will imply by extrapolation that:

(1) Roughly 40 members would be in a position to financially contribute to EM+ (both in kind and cash contributions);
(2) Of which roughly 5 partners would provide in kind contributions.

Among those **40 paying members**:

- 5 would provide 30k contributions each;
- 5 would provide 10k contributions each;
- 25 would provide 5k contributions each;
- 5 would provide in kind contributions each (assumed worth 5k each);
- Smaller contributions (<5k) are possible (although not taken into account in the following example)

As a result, the overall budget which will be provided by 40 paying members will amount to 325k in cash (350k with in kind contributions). This would be sufficient to comply with the minimum based scenario.

Optimum scenario

EM+ gathers 121 contributing members.
Among those 121 members:

- 15 could provide 30k contributions each;
- 15 could provide 10k contributions each;
- 50 could provide 5k contributions each;
- 15 could provide 1000 €
- 11 could provide 500 € and;
- 16 providing in kind contributions (assumed 4k each);

As a result, the overall budget which will be provided by 121 paying members will amount to 930,5k€/year (870,5k in cash and 60k in kind contributions). This would be more than sufficient to comply with the optimum based scenario.

EuroMarine+ integrating activities	Minimum-based scenario		Optimum-based scenario	
	Predictive amount / integrating activities (k€/year)		Predictive amount / integrating activities (k€/year)	
Science-Policy Interface	145		345	
MRI & Data	40		80	
Training & Education	40		152.5	
Coordination/Dissemination	92		108	
Total	**317**		**685,5**	
Scenarios	Indicative contributions (€) from **40 members**		Indicative contributions (€) from **121 members**	
	In Cash	*In Kind*	*In Cash*	In Kind
	5 partners providing 30k each= 150k 5 partners providing 10k each = 50k 25 partners providing 5k each= 125k + other partners providing potentially smaller in cash contributions **Note: These numbers are indicative;**	5 partners providing 5k each= 25k	15 partners providing 30k each = 450k 15 partners providing 10k each = 150k 50 partners providing 5k each = 250k 15 partners providing 1k each = 15k 11 partners providing 0.5k each = 5.5k **Note: These numbers are indicative;**	15 partners providing 4k each= 60k
Total Scenarios	***In cash + In kind = 350k€/year***		***In cash + In kind = 930,5k€/year***	

4. EuroMarine+ Action Plan: three phases to secure a sustained and self funded network

The 2013 interim period will enable to set-up the EM+ structure and more particularly to achieve:

- the signature of the MoU;
- the implementation of the EM+ secretariat;
- the setting-up of EM+ financial rules;
- the elaboration and signature of the Consortium Agreement and the establishment of the le entity;
- the preparation of the first EM+ General Assembly.

The first members signing the MoU in 2013 and engaged towards the establishment of EM+ by 2014 v provide very diverse *in kind* resources ranging from the opening of planned courses to participants fr other members, providing secretarial assistance, maintaining elements of data and disseminati infrastructures, etc.

From 2014 onwards, EM+ will then fulfil its functions according to an action plan which could composed of three consecutive and different operational phases here described below.

4.1 First Phase: based on in cash and in kind contributions from members

This first phase will start beginning of 2014 when the EuroMarine+ consortium and legal entity is set-up and the first budget voted.

The main activities will comprise the following elements:
- Present EM+ to future members and key stakeholders during the first General Assembly;
- Facilitate European young researchers to take part in training (and education) activities, either join planned or nationally/regionally planned and jointly promoted, but only partially funded;
- Coordinate and mobilise EM+ members to act towards specific European actions and initiatives (ca from ERA-Nets+, JPIs, Life and Structural Funds, Technological Platforms, Horizon 2020, Interreg Vb anc etc.);
- Promote centralized data services with links to a variety of marine experts, existing services a expertise in our network for different target groups like policy makers, interested, and general pub media (VLIZ demonstrator, add website).

4.2 Second Phase: based on an enlarged consortium and tiered fees (access to specific EuroMarin services)

This phase is anticipated to start in 2014.

The main activities in this phase will comprise the following elements:

- Organize own calls for proposals for diverse flagship activities;
- Organize working groups and strategic/foresight workshops with selected stakeholders of mid-te duration to produce policy products on interdisciplinary & innovative topics for joint research planni & programming strategies & roadmaps in relevant fields of overlapping interest;
- Organize summer schools to promote team work and interdisciplinary training;

- Inform research funding agencies, including DG Research on behalf of EM+ on interdisciplinary & innovative marine research topics, strategies and roadmaps;
- Promote exchange of data and dissemination material on many levels in a European context.

4.3 Third Phase with external funding

This phase should start with some overlap to the second phase, as it is dependent on the establishment of the EuroMarine+ legal entity and on success rates in obtaining external project funding. Other major activities, like a series of strategic workshops and conferences could be funded through other programmes. Therefore, few strategic activities here described below will have to be further discussed in the first phase of EM+:

- Implement joint research planning in the form of joint (pilot) research projects, possible as parts of bi- or trilateral programmes;
- Provide expertise // a legal structure for writing and submitting joint proposals as well as managing those of overarching EM+ interest;
- Provide infrastructure access services, potentially managed by EM+ staff and supported by an advisory board;
- Set up full cross-training programme, managed by EM+ staff and supported by an advisory board;
- Provide more centralized data services (repository, distribution, development), which could be managed by EM+ staff or a service provider, including the spreading of EM+ products, pooling of expertise, access to dissemination material etc.

Specific services which require a more or less permanent backbone should be organised and aligned with research infrastructure developments as described in the next chapter. The others could have pilot character and thus would be operated on a project basis.

5. Fund-raising plan for future EM+ products and services

To secure long-term sustainable operation of EM+, it is proposed to follow two strategies, one more suitable to basic research and one more applied to marine research:

1) to link our plans and activities to major marine European Research Infrastructure Consortia (ERICs) like EMBRC, Life Watch and the main ones emerging for the marine segment of Earth Observation (e.g. Euro-ARGO, EMSO);
2) to get involved in industry- or governance-driven maritime clusters on a regional (i.e. North Sea, Atlantic or Mediterranean Sea) and/or European level(s).

5.1 Rationale

EM+ should be the driver for innovative knowledge-based products & services generated from the high-level research capacities of its members and of interest to founders and the society at large, including industrial development. This could be a unique selling point of European science in general, linked to its highly educated work force and will be crucial for the sustainable development of the maritime sector in the coming decades.

Two options could be identified.

1) Through the RI link, ideas for novel training concepts and formats can be tested and implemented as well as products and services with potential for take-up by start-up companies;
2) Through the clusters, ideas can be expanded to fund start-ups taking off, to implant ideas for new knowledge-based products and services into existing SMEs or larger companies, and also to further vocational training initiatives (technicians, software engineers etc), often done with regional funds, and needed for generating more added value and more jobs within Europe.

Value chains (where EM+ could provide major input):

1) Data services (oceanographic, environmental and biological) and further services like biodiversity and ecosystem know-how of EM+ members for offshore renewable developments (wind, wave, tidal, biomass, incl. multi-purpose platforms), maritime spatial planning, environmental assessments & management aspects, breeding, harvesting, yield calculations etc.
2) Products like a variety of marine-related data and samples / species / extracts, as well as services based on our biodiversity know-how, for the marine component of the knowledge-based bio-economy, including red, green, and especially white or industrial biotechnology, fisheries and mariculture aspects;
3) Services and products (as detailed under 1 and 2 above) for the sustainable exploration and exploitation of marine mineral resources, to safeguard other marine values and enable sustainable harvesting, with the least environmental impacts possible, safeguarding sensitive habitats;
4) Services and products (as detailed under 1 and 2 above) for the exploitation of marine oil & gas resources, esp. in cold or other sensitive sea areas to safeguard other marine values and enable mining with the least environmental impacts;
5) Monitoring and diagnostic services and products to maintain ocean health, amenity value, tourism, provide early warning for invasive species, harmful algal blooms etc.

Several very similar services were detailed by the DS3F CSA project with inputs from eight workshops and two conferences in their "Message from the European Deep Sea and Sub Seafloor Research Community" as "Grand Challenges: opportunities for science and society"[3].
EM+ planned activities will have to avoid duplication with such kind of initiative.

[3] www.deep-sea-frontier.eu

5.2 Fundraising through links to Marine Research Infrastructures

Fundraising for these two major "options" can be done in the following way: for European RI, one member will stay in close contact to its national ministry for research to find out which RIs are on the national roadmaps and how these can be influenced, if the marine ones are underrepresented. In case EM+ has several members from one country, a coordinated lobby activity will be developed, either focussing first on one RI, or distributing the workload to lobby for several RIs in parallel to the partners according to their areas of expertise.

In parallel, EM+ governing board will develop policy advice to target the Brussels groups important for funding the preparatory and/or start-up phases of RIs. This will be done in close cooperation with the Marine Board and target not only the Research Directorate General, but also other Commissioners (e.g. DG MARE), European Parliamentarians (e.g. ITRE) and relevant council meetings (eg environmental, regional development or research minister councils).

This has to be well coordinated as, without national long-term commitments to fund RIs, the EC will neither fund their preparatory nor start-up phases. Possible relevant RIs which are entering the ERIC starting phases are LifeWatch, EMBRC and EMSO.

5.3 Fundraising through links to marine and maritime clusters

For the second option, regional organisations, as chambers of commerce, technopoles, associations, topical clusters like EMSAC, would have to be contacted and synergies sought in order to join these long-term structures. EM+ or more likely some of its members could become a member or associated member to those relevant clusters, i.e. in advisory groups, think tanks, task forces, supervising boards etc. In that manner, EM+ would profit from their calls and other benefits (i.e. establishing close links to regional economies, regional funding, building of infrastructure, sometimes incl. new applied research facilities etc.).

In areas where no maritime cluster exists, EM+ would have the chance to start forming one, together with SMEs and regional policy representatives, using a variety of national and European regional funds for innovation. If this is the case, even some medium-term staff positions could be funded servicing the cluster needs and providing the necessary interface between the three groups. Close cooperation with CPMR, the Conference of Peripheral Maritime Regions is advocated to develop win-win situations. Funding for setting-up/consolidating clusters is available, i.e. from Interreg IV, DG Enterprise & Industry, Horizon 2020 etc.

A long-term strategy of EM+ could be to collaborate in mega-clustering of maritime areas, i.e. in promoting a public-private partnership, as asked for (for example in COM 2012, "A Stronger European Industry for Growth and Economic Recovery") for select value chains as listed above, either for larger regions (Atlantic incl. North Sea, Western MED, for the Baltic this exists already), or even for Europe as a whole, with a topical focus. In the quoted paper the JTI on Bio-based Industries for Growth is addressed, including, besides scaling-up of biomass supplies, the development of new bio-based products and materials as well as, innovative processes and technologies to facilitate exploitation of marine biomass.

It is important to be aware that there are both industry-driven and policy-driven clusters, with the difference that some are oriented strongly along value generation with new products and services and others more concerned with networking and regulatory frameworks and activities.

EM+ membership with regional/topical clusters would be decided according to EM+ strategic objectives. According to DG Enterprise, successful clusters have to express political will and provide stakeholder platforms as well as rooms for entrepreneurs with long-term perspectives (more under www.clustercollaboration.eu).

In addition EM+ can also target project funding along three lines:

- Research and innovation projects (funding-wise often to be differentiated into basic, societal relevant and applied research);
- R&D focussed projects;
- Policy & innovation focussed projects.

5.4 Fundraising through R&D projects

Several of EM+ members would promote bilateral/multilateral research projects; relevant EM+ members could apply jointly for these funds (e.g. CNRS and MPG for basic research or AWI and Ifremer for more societal relevant research).

Example: Societally relevant joint research initiative in Germany

In Germany, the Helmholtz Society dedicates a large part of their internal funding to joint projects between its members (i.e. GEOMAR and AWI) with a small option for other partners to participate or at least influence and profit from these projects, mostly focussed on infrastructure (e.g. Marco Polo programme, Cosyna project). One of their institutes has a strong focus on infectious diseases, the HZI in Braunschweig, which might open new roads of cooperation for KBBE and health-related issues with a marine component, already tried out with the GEOMAR, now also a Helmholtz Institute, which promotes pharmaceutical applications of marine bacteria and fungi.

For very applied research the environmental ministries and agencies can be contacted, often involved in twinning initiatives, (impact) assessments of infrastructures (platforms, extraction, cables, pipelines) crossing borders, along river estuaries etc., depending on the topic EM+ members want to address.

Also Innovation programmes like the German ZIM provide funding for industry-driven research with academic partners and could be used, e.g. for marine sensor and observatory developments. ZIM funds clusters, small and multi-party research projects both with a clear goal towards commercial products.

Some Technology Platforms and ERA-Nets use national funding criteria for EU-wide calls so there is an almost gradual transition between national and EU-wide projects e.g. the MARTEC ERA-Net, focusing on marine technology. Recently the SEAS-ERA-NET opened a call for potential interest in the past for a sub-group of EU countries with select topics and BONUS plus has just opened another call for Baltic Sea Research.

5.4.1 Human Resource Development (HRD)

For human resource development and capacity building several avenues can be explored for funding.

Integrating Training Networks and many national, bilateral and multilateral funding exist for doctoral schools. As the students nowadays are from several European and third countries, this is the first opportunity to exchange best practice and agree on new skills needed by future marine scientists between and among EM+ members, even with little extra funding.

Fellowships for mobility of post-docs are manifold, especially since the COFUND initiative of the EC started. These can be exploited in a strategic way, i.e. when and if EM+ interest and links to RI are taken into account and options for hiring the fellows after the mobility phase are clearly presented by the EM+ members. The HFSP (human frontier science fund) does include funding of young transnational teams bringing the frontiers of biological research forward and might provide an option for funding exciting flagship initiatives.

Also direct exchange and capacity building between marine RIs is possible, which can be used to further EM+-related HRD.

KIC initiatives (EIT) encompass a strong educational component in addition to research and entrepreneurship: their developments should be carefully monitored by EM+ as for the JPI OCEANS, ERA-NETs, articles 185 etc.

5.5 Policy & Innovation: food for thought

External policy- and innovation-driven projects and initiatives can be also linked to future EM+ programmes:

- EM+ should target and promote key messages to specific funding agencies sometimes operating in partnerships (e.g. Germany and the Netherlands);
- Initiatives like Seas-ERA-Net and BONUS develop policy-and innovation-related calls for which the marine scientific community is asked to provide input which EM+ can coordinate;
- EM+ should strengthen collaboration with policy bodies such as CPMR active in promoting marine and maritime issues of peripheral EU-regions, and its regional sub-bodies for the Mediterranean, North and Baltic Sea areas.

EM+ could also fulfil a role in providing inputs into regulatory and standardisation issues often funded by special agencies or even industry associations linked to standardisation bodies (e.g. ISO, CEN, in Germany TÜV, VDI) notably through the development of specific methodologies and techniques. To be actively present i.e. in standardisation initiatives is a good way to bridge the gap between research and its technological development and application for commercial products and services.

Funds for policy-related projects often do not come from research ministries but from those focussing on environment, maritime and economic development and innovation, as these are all trying to bridge the many gaps between scientific knowledge and its application in regulations, standards, and lastly commercially viable products and services produced by existing or new enterprises.

In principle all RTD&I funding of DG Research is also policy-driven. In Horizon 2020, this orientation is expected to become stronger for the marine and maritime research (one of the seven "societal challenges") and the innovative aspect, for instance in relation to marine biotechnology is under the "Industrial leadership" pillar.

EuroMarine+ will continuously strive to identify and exploit win-win situations to further our research strategy and vision.

Literature

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