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MARITIME RESEARCH SUPPORTED BY EUROPEAN UNION

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Abstract

This paper outlines the opportunities for maritime related research and development (R&D) projects in Europe with regard to a future EU Maritime Policy. Describing the contribution from the European Research Framework Programmes (FP), as well as from other research activities as COST, EUREKA and INTERREG, and their impact on the marine and maritime sector. A showcase of FP6 projects with Latvia participation analysis are considered, as well as the description of thematic areas where maritime related projects has been successfully funded. As successful examples on increasing of awareness of EU Maritime related research are discussed within projects ENCOMAR-TRANSPORT and EROMAR-BRIDGES.

Anotācija

Pētījumā izklāstītas iespējas, ko šobrīd sniedz ar jūrniecību saistīti pētniecības un attīstības projekti Eiropā kopējā Eiropas jūrniecības vadlīniju kontekstā. Tāpat pētījumā aprakstītas atbalsta iespējas no ES Ietvara Programmām (IP), kā arī tādām pētniecības programmām, kā COST, EUREKA un INTERREG, kā arī šo programmu ietekme uz jūrniecības sektoru. Plašs pārskats par 6.IP jūrniecības projektiem un Latvijas partneru dalību tajā tiek apkopots, vienlaikus analizējot tematiskās prioritātes, kurās sekmīgi tiek finansēti jūrniecības pētījumu projekti. Par piemēru var minēt tādus EK finansētos projektus, kā ENCOMAR-TRANSPORT un EROMAR-BRIDGE, kuru mērķis ir veicināt informētību par ES atbalstītām pētniecības iespējām.

Introduction

Marine research has been identified as the EU's one of overall strategic objectives for 2005-2009, where it is noted that an all-encompassing maritime policy should be supported by excellence in marine scientific research, technology and innovation [1]. Research is a cornerstone that supports competitiveness and sustainable development in line with the three pillars of the Lisbon Strategy - Economic, Social, and Environmental [2]. Research provides the scientific knowledge base that supports the safe and sustainable development of marine resources [3], services and industries in a more integrated way for the benefit of EU citizens, by promoting employment and maintaining Europe's knowledge-based competitive advantage over world's competitors. Research provides the necessary scientific underpinning to the formulation and implementation of workable policies and strategies for marine governance at

local, regional and global levels, and contributing to the dissemination of appropriate best practices and technological solutions not only in maritime sector. Marine sectors in which advanced research are foreseen to significantly contribute to sustainable development and economical growth [4,5] are, shipbuilding and maritime transport, port management, fishery, energy and tourism together with restoring degraded marine ecosystems and developing sustainable forms of marine aquaculture. The specific areas in which the contribution of research is needed include: developing the ecosystem-based management approach, including marine spatial planning; the development of technical and managerial/institutional solutions for coastal zone protection and management; sustainable management of resources and restoration of degraded marine ecosystems; environmental monitoring technologies – GOOS (Global Ocean Observing System), GMES (Global Monitoring for Environmental Security); assessment tools; safe maritime transport, ship disposal and secure maritime structures. Furthermore, research helps in fighting the pollution of seas (oil, SO₂, NO_x, acidification) and their eco-systems, including species transfer, mitigation or preparedness for natural disasters (tsunami, typhoon, flooding), and understanding the global climate change. Land-shore interfaces (especially discharges to the sea) are also a main concern of research activities, as well as marine safety and security (cf. the new international port security rules), piracy (a real, current problem in some parts of the world traversed by European shipping) and terrorist threats.

This could be outlined that certain economical opportunities can be expected [1] from research in marine sectors as: biotechnology for new pharmaceuticals and food-related compounds, or exploitation of renewable energy sources (tidal and wave power, offshore wind farms); or further development of environmentally compatible technologies for the utilisation of natural resources (seabed minerals, water desalination). Marine biotechnology in Europe has huge potential for innovative, sustainable research, it has been valued at \$2.4 billion of global market with a predicted growth rate exceeding 10% per annum, making marine biotechnology one of the most exciting emerging technology sectors. Marine biotechnology will contribute to nearly every industry sector, from healthcare to bioremediation and from cosmetics to nutraceuticals (i.e. nutritional supplements). Furthermore, marine metagenomics [1] provide a novel approach to the exploitation and understanding of an, as yet, poorly understood marine biodiversity, and nutraceuticals is a major growth area for both the pharma, food and feed sectors.

It has been recognised by EU publicly funded or co-funded research supporting the sustainable management, production and use of natural resources to provide new competitive products, whilst decreasing the environmental impact and maximising social benefit [3]. This is a vital issue pointed to the shipbuilding and ship supplying industry, which in meanwhile supply the largest amount of resources to research, development and innovation. European shipyards [4] are world market leaders in terms of turnover and innovative products and processes, investing 10% of their annual turnover in research and innovation. It is a high-tech industry. In most maritime fields of activity, improved functions are driven by innovative ships and other floating structures. A competitive European shipbuilding industry is a crucial factor towards improved maritime performance, which leads to exploiting growth opportunities in several related maritime fields. This is particularly the case for the Maritime transport industry that is growing at a very high rate: around 80-90% of global trade and European import/export is transported by sea; more than 40% of EU internal trade is waterborne. High quality waterborne transport is less costly and more environmentally friendly than road transport [5], and a shift between the two modes could lead to millions of euros of savings. The development of innovative, efficient, safe and environmentally sustainable ships, as well as appropriate consideration to hinterland connections in expanding port capacities, is paramount to meeting this target.

Maritime research priorities and agenda have been set up by consultation with industry stakeholder groups (i.a. the Waterborne Technology Platform (WTP) [6,7,8], the Maritime Industry Forum [9]) and in collaboration with the European Commission Directorate General (DG) Enterprise (ENV), Research and Technological Development (RTD) [10] services in charge of sectoral policy making, in order to ensure that the research is correctly targeted. The development of future policies demands an early scientific input in the process from all supportive research community therefore providing formulation of realistic and enforceable regulations and the creation of new opportunities. These consultancy groups are open to sector representative associations from all EU member states and associated countries, however only few new member states and associated state countries are active partners in this decision making process. As example Waterborne Technological Platform still lack any representative from Latvia maritime sector [11], this is inexcusable neglect for country with centuries long shipping and shipbuilding tradition. Recently few EC funded activities as ENCOMAR-Transport [12] and EUROMAR-BRIDGES [13] has overtaken the initiative to raise the awareness within new member states and associated countries in maritime transport research and involvement of sector players in more active participation in political decision making for future maritime research policy. Mutually, the related competitiveness policy areas can gain maximum benefit from integrated and persistent European research stakeholder activities. This leads to robust and widely acceptable solutions, supported by scientifically validated knowledge, requiring continued engagement of the full spectrum of stakeholders [1,3], from government, civil society and research organisations together with private sector and individual initiatives.

Opportunities offered by European research funds

Marine research by its very nature, has many international aspects and will have to be further internationalised in line with globalisation trends. This implies a need to both attract talent and experience from other parts of the world to work with European teams in pursuit of knowledge and viable solutions in Europe, and to bring European expertise to bear on problem solving in the socio-economic context of international co-operation partner countries. Research activities in Europe are primarily addressed by the EC Directorate General for Research and Enterprise both of them are responsible for preparing of EU research Framework Programmes (FPs) and encapsulating Maritime Policy in it. Overall European research is still fragmented, with duplicated efforts and often poor communication between programmes. Consequently the efforts to build a European Research Area (ERA) are a major change in approach to address these weaknesses. ERA aims at integrating research efforts, better structuring research capacity and coordinating European research activities, while at the same time working towards increasing the impact potential of research through links with education and innovation, and by placing an emphasis on multi-stakeholder engagement and effective communication.

It has been recognised that EU research funding has a significant economic impact: each euro invested in Framework Programmes leads to a mid- to long-term economic return of between four and seven euros. Therefore with each FP's funding for Maritime research dramatically increases. It can be distinguished between different funding schemes ensuring development of maritime excellences: science-driven support from Community under **FP's** [14] and **COST** [15] together with **EUREKA** [16] and in particularly for Baltic Sea region the Regional Aid support thought **Interreg III** (Interreg Baltic) [17] programme. A more detailed description of COST, EUREKA and Interreg are given in the next paragraph however for analysis Framework Programmes are described in the next chapter.

An intergovernmental framework for European Co-operation in the field of Scientific and Technical Research Founded (**COST**) in 1971 [15], initially allowed the co-ordination of nationally funded research on a European level. COST Actions cover basic and pre-competitive research as well as activities of public utility. COST has clearly shown its strength in non-competitive research, in pre-normative co-operation and in solving environmental and cross-border problems and problems of public utility. It has been successfully used to maximise European synergy and added value in research co-operation and it is a useful tool to further European integration, in particular concerning Central and Eastern European countries, also welcoming the participation of interested institutions from non-COST member states without any geographical restriction. Ease of access for institutions from non-member countries also makes COST a very interesting and successful tool for tackling topics of a truly global nature.

To emphasise that the initiative came from the scientists and technical experts themselves and from those with a direct interest in furthering international collaboration, the founding fathers of COST opted for a flexible and pragmatic approach. COST activities have in the past paved the way for Community activities and its flexibility allows COST Actions to be used as a testing and exploratory field for emerging topics. The member countries participate on an "à la carte" principle and activities are launched on a "bottom-up" approach. One of its main features is its built-in flexibility. This concept clearly meets a growing demand and in addition, it complements the Community Framework Programmes.

Currently COST has developed into one of the largest frameworks for research co-operation in Europe and is a valuable mechanism, co-ordinating national research activities in Europe. Today COST had around 230 running Actions (2006) and involves approx. 30,000 scientists from 34 European member countries and more than 160 participating institutions from 23 non-member countries and Non Governmental Organisations. Any institution willing to participate in COST framework are welcomed and there are no particular funding calls so that means that you could get involved just instantly!

EUREKA is a pan-European network for market-oriented, industrial R&D. Created as an intergovernmental Initiative in 1985 [16], EUREKA aims to enhance European competitiveness through its support to businesses, research centres and universities who carry out pan-European projects to develop innovative products, processes and services. Through its flexible and decentralised Network, EUREKA offers project partners rapid access to a wealth of knowledge, skills and expertise across Europe and facilitates access to national public and private funding schemes. Through a EUREKA project, partners develop new technologies for which they agree the Intellectual Property Rights and build partnerships to penetrate new markets.

The EUREKA Clusters play a key role in building European competitiveness, driving European standards and the interoperability of products in a wide range of sectors. The result is a clear demonstration of the strength of pan-European teamwork in the European Research Area. The EUREKA Umbrellas are thematic networks which focus on a specific technology area or business sector. The main goal of an Umbrella is to facilitate the generation of EUREKA projects in its own target area.

Each year hundreds of individual projects are initiated by European companies, an increasing number of which are SMEs. These contribute to improved wellbeing, security, environment and employment in Europe and beyond.

By encouraging and assisting businesses to innovate, the EUREKA Initiative complements the European Union's Framework Programme in working actively towards the common European objective of raising investment in R&D to 3% of GDP by 2010.

The Baltic Sea Region (BSR) **INTERREG III B** Neighbourhood Programme belongs to one of the three different strands of the European Community Initiative INTERREG III. The programme is part-financed from the European Regional Development Fund (ERDF) covering the period 2000-2006. Strand B of the INTERREG Initiative supports transnational co-operation to enhance balanced and sustainable development of the European territory.

The Baltic Sea Region is one of the 13 European INTERREG III B co-operation areas. Eleven countries, namely the EU Member States Estonia, Denmark, Finland, Germany, Latvia, Lithuania, Poland and Sweden, further on Norway, North-West Russia and Belarus are participating. Their representatives have jointly prepared the main programme reference document (the Programme), including an analysis of the economic, social, spatial but also environmental potential of the BSR. Concluding from that, priority fields for transnational project activities were identified. Only projects falling in this scope of priorities and measures, and attracting partners from different BSR countries will be eligible to receive ERDF support. The INTERREG III B programme's specific feature is to promote joint solutions to joint problems by transnational co-operation.

Due to EU enlargement as of 1 May 2004, the four BSR new Member States (Estonia, Latvia, Lithuania & Poland) are eligible for full participation in ERDF funded projects, both as Lead Partners and project partners, starting from the fifth call for project proposals (12 January - 27 February 2004).

Only recently introduced Neighbourhood Programme (NP) supporting the cross-border and transnational cooperation along the external borders of the EU in the framework of existing INTERREG programmes. All INTERREG programmes bordering Tacis countries operate as NPs with fixed financial allocations from Tacis programme (for partners from the Tacis countries). The overall idea of the NP is to allow the joint projects (involving partners from the EU MS as well as partners from Russia/Belarus) to submit one application that will be jointly assessed and approved in regard to the project activities to be carried out on internal (EU) and external (Russia and Belarus) side of the border. The first call for project application in the Baltic Sea Programme 2007-2013 is planned for December 2007.

Maritime Research in FPs

European Community Research, Technological Development and Demonstration Framework Programmes concentrate RTD efforts towards specific challenges faced at a European and international level within a limited number of strategic thematic priorities. Within each priority, detailed research topics and themes are identified. The Framework Programme is a EU cornerstone supporting research for the formulation and implementation of Community Policies, by providing scientific contributions that are targeted on precise needs and are coherent across various policy areas.

There has been an evolution of the underlying approaches of FPs from a largely technology-driven approach (FP4: 1994-1998), through problem solving (FP5: 1998-2002) to the establishment of the European Research Area within FP6 (2002-2006) and the new FP7 (2007-2013). A Community support within all Framework Programmes are outlined in Figure 1. where it can be observed that planned EU support for the new FP7 has almost doubled compared to the forerunner FP7.

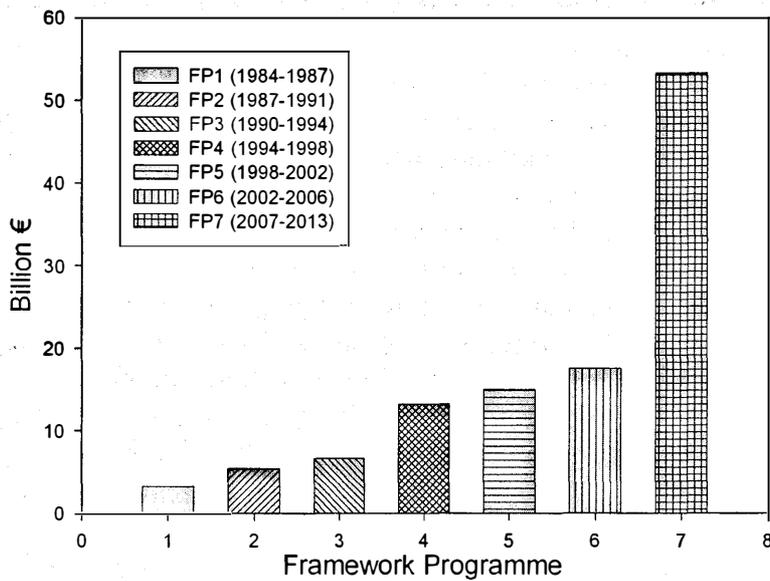


Fig.1. Evolution of EU research Framework Programme budgets.

In financial terms, the European Community Framework Programmes for research, technological development and demonstration account for a modest percentage of the total public effort. This means that most of the marine-related research is going on through a variety of programmes and activities. An overview on EC support to maritime related research are given in Figure 2. indicating increase from 2 to 4% of total FP funding allocating for maritime research.

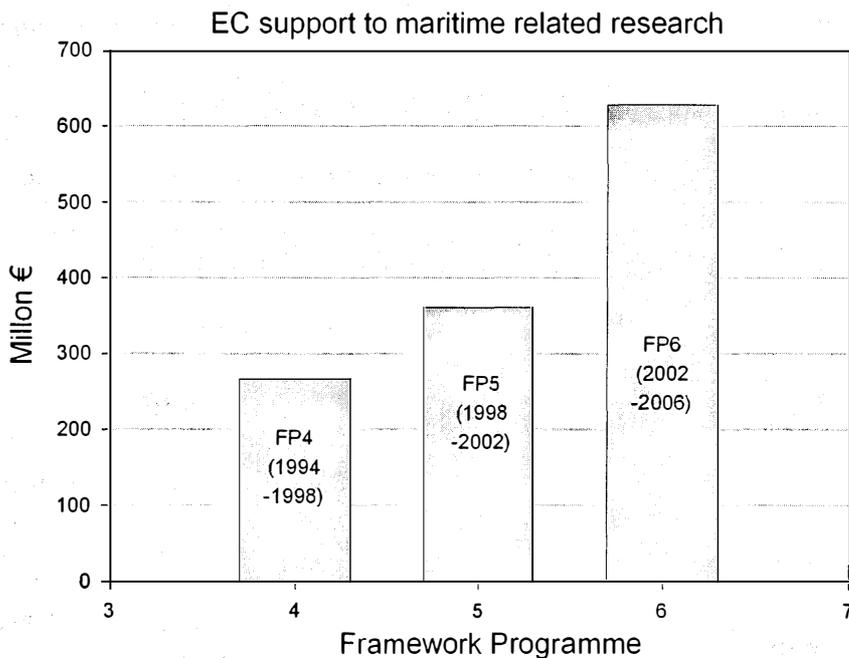


Fig.2. EC support to maritime related research FPs 4-6.

Although maritime research is not a single thematic priority within FP6, a wide range of marine-related research activities are undertaken under the different thematic priorities managed by Directorates responsible for Ecosystems, Sustainable Transport and Energy, Space, Biotechnology, Food Quality and Safety, International Co-operation and research for Policy Support (reflecting its crosscutting nature).

An analysis of these activities [1] showed in Figure 2 and Figure 3, that within FP6 more than €600 million of European funding has been provided to date towards research projects in the maritime domain Figure 3.

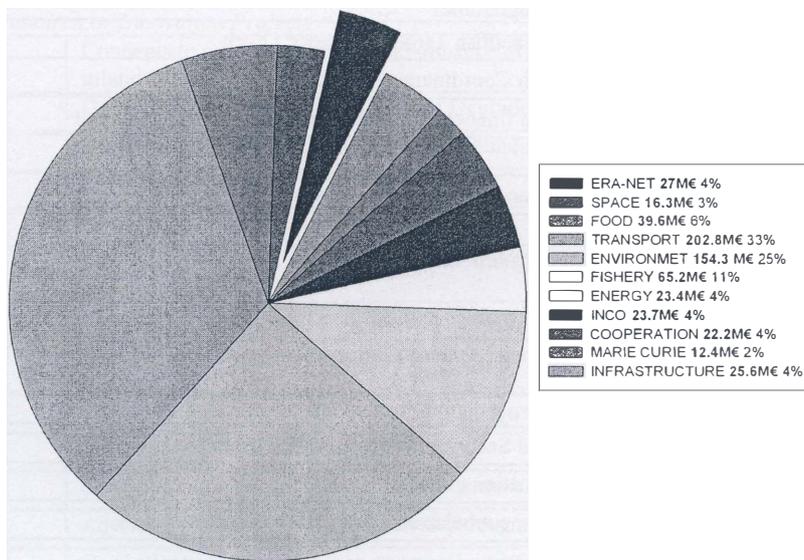


Fig.3. Distribution of FP6 funding for maritime related research

Within FP6, emphasis is given to activities enhancing and structuring synergies within the ERA-NET. Initiatives such as BONUS (Baltic Sea Science Network of funding agencies) and Marine-ERA (Marine RTD programmes in Europe) stimulated and supported programme coordination and joint activities at both national and regional levels. FP6 introduced new concepts and tools, such as the Networks of Excellence, to structure thematic research domains better by supporting long-lasting collaborations and integration, and Integrated Projects, aimed at gathering the necessary multidisciplinary critical mass around a specific research theme. A showcase of FP6 funded projects with indication of Latvian partners participating in those projects is summarised in Tables 1-11. This should give an overview and inspiration to those who are still looking to participate in EU funded research as there are so wide possibilities to enter. As example could be stated projects ENCOMAR-Transport [12] and EUROMAR-BRIDGES [13] projects that focused on helping to jointly use R&D potentials and resources and providing practical support for projects initiation from new partners from the New Member States, Candidate Countries, Russia and Turkey in maritime research. Technically, enhanced exchange of information in these countries, technology transfer and research cooperation initiated by the project are base to meet the demands of European transport policy as defined in the White Book of Transport.

Table 1

ERA-NET (Coordination Actions)**Total funding: € 27 million**

Acronym	LV	Full name of the project	Funding
BONUS	x	BONUS for the Baltic Sea - network of funding agencies	3.00
ECORD		European Consortium for Ocean Research Drilling	2.40
MarinERA		Coordination of national and regional marine RTD activities in Europe	2.95
AMPERA		European Concerted Action to foster prevention and best response to accidental marine pollution	1.68
BiodivERSA		An ERA-Net in biodiversity research	2.84
EUROPOLAR		The European Polar Consortium: strategic coordination and networking of European polar RTD programmes	3.00
COASTAL		Control Objectives and Shellfish Target Assurance Levels	0.19
CIRCLE		Climate Impact Research Coordination within a Larger Europe	2.96
CRUE		Coordination of research financed in the EU on flood risk management	3.00
MARTEC		Maritime technologies	2.00
MARIFISH		Coordination of European marine fisheries research programmes	3.00

Table 2

SPACE (Priority 1.4)**Total funding: € 16.3 million**

Acronym	LV	Full name of the project	Funding
MERSEA		Marine Environment and Security for the European Area	14.00
PEARL		Port environment information collector	0.89
INSEA		Data integration system for eutrophication assessment in coastal waters	1.38

Table 3

FOOD (Priority 1.5)**Total funding: € 39.6 million**

Acronym	LV	Full name of the project	Funding
<i>Integrated Projects (IP)</i>			
SEAFOODplus		Promoting health, together with safe, high quality seafood in a consumer-driven fork-to-farm concept	14.40
Imaquanim		Improved immunity of aqua-cultured animals	8.02
AQUAMAX		Sustainable aquafeeds to maximise the health benefits of farmed fish for consumers	10.60
<i>Specific Targeted Research or Innovation Projects (STREP)</i>			
BIOTOXMARIN		Development of novel analytic tools for the detection of marine biotoxins	1.32
DETECTOX		Development of an SPR-based biosensor for the detection of lipophilic phycotoxins in shellfish residues	0.81
BIOTOXMARIN		Development of cost-effective tools for risk management and traceability systems for marine biotoxins in seafood	3.00
<i>Coordination Actions (CA)</i>			
CONSENSUS		Consensus	1.45

Table 4

TRANSPORT (Priority 1.6.2)**Total funding: €202.79 million**

Acronym	LV	Full name of the project	Funding
<i>Integrated Projects (IP)</i>			
HERCULES		High efficiency engine R&D on combustion with ultra low emissions for ships	15.00
InterSHIP	x	Integrated collaborative design and production of cruise vessels, passenger ships and Ropax	19.00
SAFEDOR		Design, operation and regulation for safety	12.00

VIRTUE		The Virtual Tank Utility in Europe	10.50
EFFORTS		Effective operation in ports	8.00
FLAGSHIP		European framework for safe, efficient and environmentally-friendly ship operations	10.21
MC-WAP		Molten carbonate fuel cells for waterborne application	9.90
FREIGHTWISE		Freight transport management systems	7.93
MOSES		Motorways of the sea	8.00
<i>Networks of Excellence (NoE)</i>			
MARSTRUCT		Network of Excellence in marine structures	6.00
VISIONS		Visionary concepts for vessels and floating structures	5.00
HTA		An alliance to enhance the maritime testing infrastructure in the EU	6.50
<i>Specific Targeted Research or Innovation Projects (STREP)</i>			
CREATING		Concepts to reduce environmental impact and attain optimal transport performance by inland navigation	2.70
DSS-DC		Decision Support System for ships in Degraded Condition	2.40
ECODOCK		Environmentally friendly coatings for ship building and ships in operation	2.00
LOGBASED		Logistics-based design	1.90
NG2SHIPI/F		New generation natural gas ship interfaces	2.00
POP&C		Pollution prevention and control of safe transportation of hazardous goods by tankers	1.60
ROTISII		Remotely Operated Tanker Inspection System II	1.70
SAFECRAFTS		Safe abandoning of ships, improvement of current lifesaving appliance systems	2.90
SAFEICE		Increasing the safety of icebound shipping	1.10
SAFETOW		Strategic Aid For Escort Tugs at Work	1.30
SHIPMATES		Ship repair to maintain transport which is environmentally sustainable	2.30
ADOPT		Advanced decision support system for ship design, operation and training	1.90
CAS		Cost-effective inspection and structural maintenance for ship safety and environmental protection throughout its life cycle	1.60
DIFIS		Double Inverted Funnel for Intervention on Shipwrecks	1.80
EU-MOP		Elimination Units for Marine Oil Pollution	1.90
GIFT		Gas Import Floating Terminal	2.30
HISMAR		Hull Identification System for Marine Autonomous Robotics	1.10
OSH		Oil Sea Harvester	2.00
SAFE OFFLOAD		Safe offloading from long floating platforms	2.00
ShipDismantl		Cost-effective and environmentally sound dismantling of obsolete vessels	1.50
SUPERPROP		Superior life-time operation economy of ship propellers	1.00
BaWaPla		Sustainable ballast water management plant	1.70
CHINOS		Container Handling in Intermodal Nodes - optimal and secure	1.50
Cleanmould		Boat hulls with enhanced performance	1.40
CREATE3S		Production to improve total efficiency of new generation short sea shipping	2.50
DE-LIGHT Transport	x	Development of lightweight modules for transport systems, featuring efficient production and lifecycle benefits of structural and functional integrity using risk-based design	2.50
HANDLING WAVES		Decision support system for ship operation in rough weather	1.70
IMPROVE		Design of improved and competitive products using an integrated decision support system for ship production and operation	2.50
OFIENGINE		Development of new thermal spraying equipment and technology for production of components for marine transport engines	1.00
POSSEIDON		Progressive Oil Sensor System for Extended Identification Online	1.20
SECURCRANE		Design of an innovative system for the drive and control of port cranes for safe remote operation	2.20
SMOOTH		Sustainable methods for optimal design and operation of ships with air-lubricated hulls	1.50

KITE		Passenger intermodality knowledge base	1.25
<i>Coordination Actions (CA)</i>			
INMARE		Technologies and methodologies for safe, environmentally friendly and efficient shipping operations in the future	0.80
ACMARE		Coordination Action to implement an advisory council for maritime transport research in Europe	1.00
CAREMAR		Coordinated academic RTD and education-supporting innovation in marine industries	0.70
SPREEX		Spill response experience	0.90
ALERT		Assessment of life-cycle effect on repairs to tankers	0.60
CAPOEIRA		Coordination Action on ports for the integration of efficient innovations and development of adequate research, development and innovation activities	0.50
MTCP		Maritime Transport Coordination Platform	2.74
PROMIT		Intermodal technologies and strategies	2.81
LINK		European passenger intermodality forum	2.00
<i>Special Support Actions (SSA)</i>			
CRONET-DAYS		Promoting and facilitating ERA-networking between European	0.05
ENCOMAR - TRANSPORT	x	Enhanced Co-operation between EU Member States and Associated Candidate Countries in maritime research on transport	0.30
ICOMOB		Icebreaker Co-operation on the Motorway of the Baltic Sea	0.14
EUOMAR-BRIDGES	x	Building bridges between EU Member States and Candidate Countries in maritime research on transport within the framework of the European Research Area	0.26

Table 5

ENVIRONMENT (Priority 1.6.3)**Total funding: € 154.26 million**

Acronym	LV	Full name of the project	Funding
<i>Integrated Projects (IP)</i>			
CARBOOCEAN		Marine carbon sources and sinks assessment	14.50
HERMES		Hotspot Ecosystem Research on the Margins of European Seas	15.00
MODELKEY		Models for assessing and forecasting the impact of environmental key pollutants on marine and freshwater ecosystems and biodiversity	8.40
DAMOCLES		Developing Arctic Modelling and Observing Capabilities for Long-term Environmental Studies	16.10
SESAME		Southern European Seas: Assessing and Modelling Ecosystem changes	10.00
<i>Networks of Excellence (NoE)</i>			
EUR-OCEANS	x	European Network of Excellence for ocean ecosystems analysis	10.00
MARBEF		Marine biodiversity and ecosystem functioning	8.71
MARINE GENOMICS		Implementation of high-throughput genomic approaches to investigate the functioning of marine ecosystems and the biology of marine organisms	10.00
EDIT		Towards the European Distributed Institute of Taxonomy	11.90
ESONET		European Seas Observatory NETWORK	7.00
<i>Specific Targeted Research or Innovation Projects (STREP)</i>			
COBO		Integrating new technologies for the study of benthic ecosystem response to human activity: towards a Coastal Ocean Benthic Observatory	2.00
ELME		European Lifestyles and Marine Ecosystems	2.50
ESTTAL		Expressed Sequence Tags of Toxic Algae	1.40
FISH & CHIPS		Towards using DNA chip technology as a standard analytical tool for the identification of marine organisms in biodiversity and ecosystem science	1.60
HABIT		Harmful Algal Bloom species In Thin layers	0.95
SEED		Life history transformations among HAB species, and the environmental and physiological factors that regulate them	1.50
EXOCET/D		Extreme ecosystems studies in the deep ocean: technological developments	2.00
FACEIT		Fast Advanced Cellular and Ecosystems Information Technologies	3.69
ECODIS		Dynamic sensing of chemical pollution disasters and predictive modelling of their spread and ecological impact	3.50

<i>Coordination Actions (CA)</i>			
ENCORA		European network on coastal research	3.00
<i>Special Support Actions (SSA)</i>			
GRAND		GRAND GOOS (Global Ocean Observing System) regional alliances network development	0.52
SEPRISE		Sustained, Efficient Production of Required Information and Services Europe is our only justification	0.33
ESONIM		European Seafloor Observatory Network Implementation Model	0.43
ASCABOS		A supporting programme for capacity building in the Black Sea region towards operational status of oceanographic services	0.46
SIMORC		Proposal to establish a System of Industry Metocean data for the Offshore and Research Communities	0.50
SEARCH for DAMOCLES		Study for Environmental Arctic Change - Developing Arctic Modelling and Observing Capabilities for Long-term Environmental Studies	0.60
BASIN		Resolving the impact of climatic processes on the ecosystems of North Atlantic basin and shelf seas: integrating and advancing observation, monitoring and prediction	0.11
TENATSO		Tropical Eastern North Atlantic Time-Series Observatory	0.55

Table 6

ENERGY (Priority 1.1.6- 1.1.6.1.3)**Total funding: € 23.42**

Acronym	LV	Full name of the project	Funding
<i>Integrated Projects (IP)</i>			
BEATRICE WINDENERGY		Beatrice offshore deepwater wind farm project	2.00
LOWEC		Low offshore wind energy cost	4.00
<i>Specific Targeted Research or Innovation Projects (STREP)</i>			
Wave SSG		Full-scale demonstration of robust and high-efficiency wave	1.00
SEEWEC		Sustainable Economically Efficient Wave Energy Converter	2.30
Wave Dragon MW		Development and validation of technical and economic feasibility of a multi MW Wave Dragon offshore wave energy converter	2.43
AWS-MKII		Deployment, monitoring and evaluation of a prototype advanced wave energy device	2.17
WaveStar		High-efficient, low-weight, pile-supported 500 kw wave energy converter	1.71
BREAKWAVE		BREAKWAVE - OWC in Breakwater Douro	2.50
AquaBuOY		Demonstration offshore wave energy plant	1.37
NEREIDA MOWC		OWC integration in the new Mutriku breakwater	0.83
ALDA		Demonstration plant of a tunnelled wave energy converter	1.36
<i>Coordination actions (CA)</i>			
CA-OE		Coordinated Action on Ocean Energy	1.50
<i>Specific Support actions (SSA)</i>			
STANDICE		Standardisation of ice forces on offshore structures design	0.24

Table 7

Policy Support SSP (Priority 1.8)

Total funding: € 65.23 million

Acronym	LV	Full name of the project	Funding
<i>Specific Targeted Research or Innovative Projects (STREP)</i>			
EFIMAS		Operational evaluation tools for fisheries management options	4.50
FISBOAT		Fisheries Independent Survey-Based Operational Assessment Tools	1.50
COMMIT		Creation of multi annual management plans for commitment	1.51
NECESSITY		Nephrops and Cetacean Species Selection Information and Technology	4.27
CAFE		Capacity, F and Effort	1.80
CEVIS		Comparative Evaluations of Innovative Solutions in European fisheries management	1.20
DEGREE		Development of fishing Gears with Reduced Effects on the Environment	2.00
POORFISH		Probabilistic assessment, management and advice model for fishery management where only poor data is available	1.00
PRONE		Precautionary risk methodology in fisheries	1.10
UNCOVER		Understanding the mechanisms of stock recovery	3.70
SHEEL*		Secure and Harmonised European Electronic Logbook	1.20
CEDER		Catch, Effort and Discard Estimates in Real-time	1.30
WEALTH		Welfare and health in sustainable aquaculture	2.53
AQUAFIRST		Combined genetic and functional genomic approaches for stress and disease resistance in marker-assisted selection of fish and shellfish	3.80
EUROCARP		Disease- and stress-resistant common carp: combining quantitative, genomic, proteomic and immunological makers to identify high performance strains, families and individuals	1.09
FASTFISH		Farm assessment of stress levels in fish	1.10
BECAUSE		Critical interactions between species and their implications for precautionary fisheries management in a variable environment - a modelling approach	2.96
EMPAFISH		European Marine Protected Areas as tools for FISHERIES management and conservation	2.39
PROTECT		Marine-protected areas as a tool for ecosystem conservation and fisheries management	2.00
ECASA		Ecosystem Approach for Sustainable Aquaculture	2.48
AFRAME		A framework for fleet and area-based fisheries management	1.32
Fine		Fisheries-induced evolution	1.80
AFISA		Automated fish ageing	0.60
SARDONE		Improving assessment and management of small pelagic species in the Mediterranean	1.10
COBECOS		Cost and Benefit of Control Strategies	1.40
BeneFish		Evaluation and modelling of benefits and costs of fish welfare interventions in European aquaculture	1.26
SEACASE		Sustainable extensive and semi-intensive coastal aquaculture in Southern Europe	1.55
IMAGE		Indicators for fisheries MANaGement in Europe	1.00
RECLAIM		REsolving CLimatic IMPacts on fish stocks	1.70
<i>Coordination actions (CA)</i>			
AQUAGENOME		Genomics in fish and shellfish: from research to aquaculture	0.79
INDECO		Developing indicators of environmental performance of the Common Fisheries Policy	0.50
DIPNET		Disease interactions and pathogen exchange between farmed and wild aquatic animal populations - a European network	0.50
GENIMPACT		Evaluation of genetic impact of aquaculture activities on native populations - a European network	0.50
IN EX FISH		Incorporating the extrinsic drivers into fisheries management	1.50
ISTAM		Improve Scientific and Technical Advice on fisheries Management (West Africa)	0.61
IMPASSE		Environmental impacts of invasive alien species in aquaculture	0.54
PANDA		Permanent network to strengthen expertise on infectious diseases of aquaculture species and scientific advice to EU policy	0.49

RANA		Risk assessment of new and emerging systemic Iridovirus diseases for European fish and aquatic ecosystem	1.18
<i>Specific Support actions (SSA)</i>			
IMPACT FISH		Impact assessment of the FP4 and FP5 Research Programmes on fisheries, aquaculture and seafood processing research area and the fishery industry	0.17
ICES-FishMap		Update and revision of the ICES atlas of North Sea fishes: a web-based application	0.10
AQUAFUNC		Integrated knowledge on functional genomics in sustainable aquaculture	0.17
ENVIEFH		Environmental approach to essential fish habitat designation	0.53
PROFET POLICY		A European platform for the communication of European RTD results to stakeholders in fisheries and aquaculture	0.76
SAMI		Synthesis of Aquaculture and Marine ecosystems Interactions	0.16
SLIME		Restoration of the European eel population: pilot studies for a scientific framework in support of sustainable management	0.19
REPROFISH		Integrating basic and applied knowledge on finfish reproduction	0.14
IBEFish		Interaction Between Environment and Fisheries - a challenge to management	0.16
AQUA Breeding		Towards enhanced and sustainable use of genetics and breeding in the European aquaculture industry	0.23
OATP		Evaluation of the promotion of Offshore Aquaculture through a Technology Platform	0.20
FEUFAR		The Future of European Fisheries and Aquaculture Research	0.49

Table 8

Co-operative and Collective research (SMEs)**Total funding: € 22.21 million**

Acronym	LV	Full name of the project	Funding
<i>Specific Targeted Research or Innovative Projects (STREP)</i>			
FINE FISH		Reduction of malformations in farmed fish species	3.02
CORALZOO		The development of an SME-friendly European breeding programme for hard corals	2.61
RACEWAYS		A hyperintensive fish farming concept for lasting competitiveness and superior production	0.89
COMPETUS		Genetic improvement of farmed sea bass, <i>Dicentrarchus labrax</i> : strain testing and response to selection	0.52
SPONGES		Sustainable production, Physiology, Oceanography, Natural products, Genetics and Economics of Sponges	1.44
IntelFishTank		Development of an intelligent fish tank for cost effective aquaculture through the control of water quality in different fish tanks	0.62
AQUAETREAT		Improvement and innovation of aquaculture effluent treatment technology	1.38
CRAB		Collective Research on Aquaculture Biofouling	1.58
TURPRO		Biological optimisation and development of processing methods for turbot farming	0.75
OCEANSAVER		Dramatically reducing the spreading of invasive, non-native exotic species into new ecosystems through an efficient and high volume capacity Ballast Water Cleaning System	0.70
SUBFISHCAGE		Development of a cost-effective submersible fish cage system	0.70
FPSO-INSPECT		Non-intrusive in-service inspection robotic system for condition monitoring of welds inside floating production storage and offloading vessels	1.09
DOLFIN		Development of innovative plastic structures for aquiculture using a new composite with crop waste as reinforcing filler	0.61
PROTENCH		Intensive and sustainable culture of the freshwater species <i>Tencii</i>	0.94
ALFA		Development of an automated innovative system for continuous live feed production in aquaculture hatchery units	1.14
MusselHarvest		Development of a cost-effective technique for mussel harvesting combined with product control and re-tubing	0.52
HULL INSPECTOR		Development of an autonomous mobile inspection vehicle for detecting structural defects in ships' hulls	1.03
KEYZONES(R)		To investigate sustainable biological carrying capacities of key European coastal zones	0.75
MAPO		Enhancing research and development projects to find solutions to struggle against various marine pollutions	0.75
FISH		Facilitating innovation for sustainable fisheries and marine resources	0.51
ALGADEC		Development of an rRNA-biosensor for the detection of toxic algae	0.59

Table 9

International Co-operation (INCO)**Total funding: € 23.68 million**

Acronym	LV	Full name of the project	Funding
CLEAN BLACK SEA		Clean Black Sea working group	0.04
GEWAMED		Mainstreaming gender dimensions into water resources development and management in the Mediterranean region	1.25
MELIA		Mediterranean dialogue on integrated water management	2.00
MANGROVE		Mangrove ecosystems, communities and conflict: developing knowledge-based approaches to reconcile multiple demands	0.85
ECOST		Ecosystems, societies, coincidences, precautionary principles: development of an assessment method of the societal cost for best fishing practices and efficient public policies	3.1
ECOMANAGE		Integrated ecological coastal zone management system	1.40
INCOFISH		Integrating multiple demands on coastal zones with emphasis on aquatic ecosystems and fisheries	4.40
PASARELAS		Discovery Modelling Mediation Deliberation: interface tools for multi-stakeholder knowledge partnerships for the sustainable management of marine resources and coastal zones	0.28
REEFRES		Developing ubiquitous restoration practices for Indo-Pacific reefs	1.70
TBTIMPACTS		Assessing impacts of TBT on multiple coastal uses	0.80
SPEAR		Sustainable options for people, catchments and aquatic resources	1.50
TRANSMAP		Transboundary networks of marine-protected areas for integrated conservation and sustainable development: biophysical, socio-economic and governance assessment in East Africa	1.70
PUMPSEA		Peri-urban mangrove forests as filters and potential phytoremediators of domestic sewage in East Africa	1.65
CENSOR		Climate variability and El Nino southern oscillation: implications for natural coastal resources and management	3.00

Table 10

Marie Curie Actions (Human Resources and Mobility)**Total funding: € 12.44 million**

Acronym	LV	Full name of the project	Funding
<i>Research Training Networks</i>			
FISHACE		FISHeries-induced Adaptive Changes in Exploited stocks	2.87
MOMARNET		Monitoring deep seafloor hydrothermal environments on the Mid-Atlantic Ridge	2.62
<i>Intra-European Fellowship</i>			
BIO-ENGINEERS		Research training network towards competitive ocean wave energy	1.82
BIOECOTOX		Influence of biological and physical processes on intertidal sediment dynamics and on the release of pollutants trapped in sediments, and the toxicity of these pollutants	0.15
BIOWARM		Marine sponges as models for assessing biological effects of the Mediterranean Sea warming	0.14
CAESAR		Capillary electrophoresis separation of dissolved carbohydrates of the aquatic realm	0.14
CD-PALEO		Development of Cadmium isotopic measurements by MC-ICP-MS using a double spike approach: Application to marine sediments and palaeoceanography	0.14
CHARMAD		Chemical characterisation and cycling of marine dissolved organic matter	0.15
DINO-CULT		Calcareous dinoflagellate culturing experiments: understanding the life cycle of oceanic species	0.15
HYDRAMED		Geological assessment of gas hydrates in the Mediterranean Sea	0.19
ISOCLIV		Exploring the influence of intraseasonal oscillations on the climate variability in the Indo-Pacific sector during boreal summer	0.15
LIST		Larvae in situ tracking: detection and identification of early-life-stages of marine organisms using in situ hybridisation with oligonucleotide probes	0.14
MACRO-MSAA		Synthesis of marine Macrolides and hybrid structures as novel Microtubule Stabilising Anticancer Agents	0.16
MARCYAN2		Ecological control of nitrogen fixation in marine Cyanobacteria	0.14
MIDI A		Molecular indicators of DNA damage in aquatic organisms	0.17

MOSEVEM		Modelling sedimentation and vegetation patterns in tidal marshes	0.14
MT GENOME G.SALARIS		The mitochondrial genome of the fish parasite Gyrodactylus salaris characterisation and utility	0.15
PLAICELIFE - LINE		Determination of plaice lifetime movements in the North Sea by linking natural and electronic data records	0.15
S.ATLANTI PLUME		The characterisation and temporal evolution of the South Atlantic plume	0.16
VENTSULFUR - MICDIV		Biodiversity of microbial communities involved in sulphur cycling at a shallow water hydrothermal vent	0.14
<i>Outgoing International Fellowship</i>			
LOTUS		Long time-series Undersea Surveillance	0.25
<i>Incoming International Fellowship</i>			
AUVI		Autonomous vehicle for underwater inspections	0.06
ECCRE		Biodiversity and vulnerability of European cold-water coral reef ecosystem	0.16
<i>European Re-integration Grants</i>			
CLOWNFISH EVOLUTION		Molecular phylogeny and evolution of specialisation in anemone fishes and in their host sea anemones	0.03
FISH CONDITION		Effects of environmental and habitat characteristics on condition and reproduction of exploited marine fish populations	0.02
PHYTODEATH		Effect of ultraviolet radiation on programmed cell death in phytoplankton: impact on biomass cycling and biodiversity	0.04
<i>Early-stage Training</i>			
RISICO		Risk assessment of surfactants in coastal environments	0.71
<i>Transfer of knowledge</i>			
PARAQUAM		Parasite pathogens in new species of Mediterranean aquaculture: an experimental approach	0.28
SEAPAID		Sea grass production and isotopic discrimination	0.13
<i>Specific Support actions (SSA)</i>			
DOCREG		Development of oceanographic research in Greece	0.04
<i>Series of events</i>			
AQUALABS		Advanced laboratory training courses in aquaculture for early-stage researchers	0.53

Table 11

Infrastructures**Total funding: € 25.58 million**

Acronym	LV	Full name of the project	Funding
<i>Integrating activities and Transnational access</i>			
SEADATANET	x	A pan-European infrastructure for ocean and marine data management	8.74
Black Sea SCENE		Black Sea scientific network	2.00
HYDRALAB-III		Integrated Infrastructure Initiative	11.81
SALVADORE		Seismic analysis of the lithosphere via advanced processing techniques and access to deep ocean recorders during exploration	0.68
METRI - 2		Marine Environment Tests and Research Infrastructure - 2	0.70
<i>Design Studies and Construction of New RI</i>			
DesignACT		Designing the European Aquaculture Centre of Technology	0.47
CeMaCE		Centre for Marine Chemical Ecology	0.93
<i>Accompanying Measures</i>			
PLANKTON-NET		An open-access framework for developing and supporting distributed knowledge centres for taxonomic data - a pilot study targeting EU phytoplankton	0.21

The Seventh Research Framework Programme (FP7)

The Commission's ambitious proposals for FP7 (2007-2013) [18] are designed to meet the needs of the Lisbon Strategy to build a Europe of Knowledge. FP7 represents a flagship programme for enhancing knowledge in Europe with also considerable potential for partner

countries and regions. The core of the proposed FP7 is the Co-operation Specific Programme which will support research in a number of thematic areas corresponding to major fields of knowledge and technology where trans-national cooperation can address European social, economic, environmental and industrial challenges [1,18].

Research relating to marine and maritime issues is integrated into all of the Themes, but in particular into those on Food, Agriculture and Biotechnology; on Environment (including Climate Change) and on Transport (including Aeronautics). The definition of the research to be supported under the Themes builds upon the input received from a wide range of stakeholders, such as contributions from policy Directorates General, international commitments of the Union, and Technology Platforms. In the context of maritime research, particularly relevant contributions were the Galway Declaration and the Waterborne Technology Platform [6,7,8]. The implementation of FP7 foresees both a need to coordinate marine and maritime research across the relevant Themes and the flexibility to respond to new policy needs as they arise. This will be achieved by supporting collaborative research through a range of funding schemes: Small and Large scale Collaborative Projects, Networks of Excellence, Coordination/ Support Actions [18, 19].

The Environment Theme will support research targeted at the sustainable management of the environment and its resources through advancing our knowledge on the interactions between the biosphere, ecosystems and human activities, and developing new technologies, tools and services in order to address global marine issues in an integrated way. Emphasis will be put on the prediction of climate, ecological, earth and ocean systems changes; and on tools and technologies for the monitoring, prevention and mitigation of environmental pressures and risks. Research will also help to develop an ecosystem-based approach, "whereby human activities affecting the marine environment will be managed in an integrated manner promoting conservation and sustainable use in an equitable way of oceans and seas". Marine spatial planning will also play an important role in developing the ecosystem-based approach to the management of Europe's marine resources.

In addition, coordination of national research programmes will be strengthened, including the Baltic Sea research support. Further relevant elements have been reinforced in the FP7 proposal, including promotion of researcher training and careers within the 'People' programme, and strengthened support to European research infrastructure and new activities to address research potential at a regional level (within the 'Capacities' programme).

The access to effective research infrastructures in Europe is a key factor in increasing competitiveness in both fundamental and applied research. A strategy on research infrastructures at European level provides added value by pooling talent, maximising resources and generating a strategic vision for research in the European Research Area. European support for infrastructure may be relevant to maritime research, such as support for marine research vessels, climate modelling super-computing facilities, a pan-European multi-disciplinary sea-floor observation network, etc.

The Seventh Research Framework Programme is designed to have strong links to other Community Programmes supporting the knowledge economy and society, in particular the proposed Structural Funds, the Competitiveness and Innovation Programme and the educational programmes. In order to achieve the desired level of impact, it will require stronger R&D efforts on the part of Member States, with more effective coordination between the EU, national and regional levels. With launching of FP'7 starting this year and opening of project proposal calls every research establishment within EU should actively seek for project partners and research consortia's for further development of EU Maritime policies. Opened thematical areas and first call deadlines are given in Tables 12-14. It should be noted that if any questions arise there are network of National Contact Points [19,12,13] to whom you can address your questions, concerns and requests for expertise.

Table 12

FP7 programme – Cooperation

Priority	First call deadline
Health	19.04.07
Food, agriculture and Fisheries, Biotechnology	02.05.07
Information & communication technologies	08.05.07; 31.12.08
Nanosciences, nanotechnologies, materials & new production technologies	04.05.07
Energy	03.05.07
Environment (including Climate Change)	02.05.07
Transport (including aeronautics)	03.05.07
Socio-economics Sciences and the Humanities	10.05.07
Space	19.06.07
Security	31.05.07
ERA-NET/ ERA-NET plus	31.07.07

Table 13

FP7 programme – People

Priority	First call deadline
Initial training	07.05.07
Life-long training	25.04.07
Industry academia	25.04.07
International dimension	03.04.07
Specific actions	26.04.07

Table 14

FP7 programme – Capacities

Priority	First call deadline
Research infrastructures	02.05.07
Research for the benefit of SMEs	04.09.07; 01.06.07; 10.05.07
Regions of knowledge	24.04.07
Research potential of Convergence Regions	24.04.07
Science and society	23.05.07
International cooperation (INCO)	02.05.07

Conclusions

It has been shown that there are different EU funded programmes that support maritime related research. Therefore, an awareness of possibilities for participation in these programmes is given by analysing previous FP6 funded maritime projects. It was addressed to all maritime research community in particular for Baltic Sea region countries to fasten the participation in the upcoming FP7. A helpful advice can be found thought Network of national Contact points within FP6 project EUROMAT-BRIDGES.

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