



**ERA-NET MARTEC**

**Maritime Technologies II**

**TASK 4.2**

**Waterborne TP**

**D 4.3**

**Review of SRA Waterborne TP**

**Finnish Marine Industries**

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	Dissemination Level	
<b>PU</b>	Public	x
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
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## Introduction

The European Technology Platform Waterborne is a forum where all stakeholders from the waterborne (sea & inland) sector define and share a common medium and long term vision (Vision 2020), driving the innovation efforts, and also define and share a Strategic Research Agenda (SRA) describing the RDI initiatives necessary to materialize the vision. With LeaderSHIP 2015 the European shipbuilding industry has initiated an ambitious program to ensure its long-term prosperity in a dynamic market and now it is continuing with LeaderSHIP 2020. R&D has been identified as the central factor to meet the challenges of the maritime transport in the coming decades. In December 2003 the MIF (Maritime Industry Forum) which includes not only the shipbuilding, shipping and offshore industry, but also stakeholders representing national and EU administration, members of the European Parliament, initiated the process for the establishment of an Advisory Council for Waterborne Transport Research in Europe, to be a platform for continuous dialogue between all stakeholders (including the EU and national government institutions), for assessing the key challenges of the 21st century for the maritime industry and the waterborne transport system and to formulate the R&D requirements for meeting these challenges, for reaching a consensus on future research directions and to support mobilization of the necessary financial resources.

### Why MARTEC II Makes Cooperation with Waterborne TP?

Many of the MARTEC II participants are also members of the Waterborne TP mirror group or support group. Therefrom MARTEC II is already a part of Waterborne<sup>TP</sup> and cooperation is essential. Members of MARTEC II participate actively to Waterborne<sup>TP</sup>'s meetings and other Waterborne<sup>TP</sup> action. Possibilities to make action together with Waterborne TP are good and synergies should be used. Cooperation with the whole sector can be strengthened through WATERBORNE<sup>TP</sup>. In MARTEC II task 4.2 focus will be in coordination the implementation of the Strategic Research Agenda (SRA; priorities defined by the Waterborne TP) especially the cooperation with the industrial community can be strengthened. Particular attention will be paid to their expression of needs, which should be addressed in the calls for proposals. The cooperation will focus mainly on maritime transport, especially in thematic calls. MARTEC II will promote the industry – academia collaboration throughout the whole innovation chain from science to business. MARTEC should especially fill the gap between future Horizon 2020 calls and national calls in maritime technologies. MARTEC will offer thematic calls to the Waterborne community.

## Exploitation Outcomes of Waterborne TP

Waterborne TP's Strategic Research Agenda was published in 2008. In this study has been used SRA's Implementation plan and its updated version from May 2011. The main goal of SRA is to achieve Waterborne TP's objectives in research area and introduce them in European level. In Exploitation Outcomes are seen achievements of products, services and capabilities that Waterborne TP has delivered from industry. Exploitation Outcomes are also demonstration of the Vision 2020 targets, showing that European waterborne industry is capable to fulfill targets of the vision. Those targets will also serve the development of European waterborne industry. In Exploitation Outcomes Waterborne TP clearly defines its targets. With those targets European community can build calls and topics for future framework program's Work Program. Those targets can also serve needs of the MARTEC II in thematic calls; especially in year 2013 when there will be no Framework Program calls because of moving to next Framework Program "Horizon 2020". MARTEC II can also bring continuance to Vision 2020.

Waterborne TP has built basis of its SRA to three pillars: sustainability, competitiveness and growth. In global economic situation these themes are the most relevant. In Waterborne SRA their meaning is seen especially in Exploitation Outcomes. One or more pillars are seen in all Exploitation Outcomes.

Table 1. Exploitation Outcomes (ref. Waterborne Strategic Research Agenda Implementation Plan).

The Exploitation Outcome	Pillar 1 Sustainability	Pillar 2 Competitiveness	Pillar 3 Growth
1. The Low Risk Ship	x	x	
2. The Low Energy, Low Emission Ship	x	x	
3. The Autonomous Ship	x	x	x
4. The Sustainable Recreational Craft	x	x	
5. The Future of Ship Designs for Short Sea Operations	x	x	x
6. The European	x	x	

<b>Cruise Ship</b>			
<b>7. Seven Day Ship Design</b>		X	
<b>8. Leading Shipbuilding</b>	X	X	
<b>9. Energy Transport in Extreme Conditions</b>	X	X	X
<b>10. Intelligent Integrated Transport Network</b>		X	X
<b>11. Intermodal Waterways</b>	X	X	X
<b>12. Accelerated Sustainable Port Development</b>	X	X	X

When Exploitation Outcomes are compared with Framework program 7<sup>th</sup> and it's Work Programs can be seen research gaps and also succeeded themes that have entered into calls. In this case it has been studied only Work Programs of Transport in 7<sup>th</sup> Framework Program. That is because topics are handling maritime technologies mainly in Transport Work Program. In next chapter there are Exploitation Outcomes listed. Exploitation Outcomes has been compared with all Work Programs of Framework Program 7 and studied to which Exploitation Outcome the topics of Work Program are related.

Only the last call of Framework Program 7 is excluded in this study because the call is opening after this study has been done. The data is according to CORDIS - Community Research and Development Information Service which is an information space devoted to European research and development (R&D) activities and technology transfer.

## 1. The Low Risk Ship

An in depth understanding of the design and operation of ships from a risk based perspective allows for development and approval of low risk ships. Better risk control options for example, new structural solutions/designs providing improved collision and grounding resistance and damage stability control are available. The standardized approval processes for ships developed using risk based design and operation has reduced costs and improved risk management. A modernized regulatory framework has been approved at IMO based on the safety-level approach together with appropriate acceptance criteria.

Table 2.As a result of Work Program related calls are identified according to Exploitation Outcome of The Low Risk Ship.

	Subprogram area	Topic
1	SST.2012.5.2-6	E-Maritime in support of compliance management
2	SST.2012.4.1-1	Human element factors in shipping safety
3	SST.2012.5.2-5	E-guided vessels: the "autonomous" ship
4	SST-2008.1.2-1	Preventive and emergency interventions to protect marine, coastal and land environments
5	SST-2008.4.1-1	Safety and security by design
6	SST-2008.4.1-3	Integral system solutions for safety
7	SST.2007.4.1-1	Safety and security by design
8	SST.2007.4.1-2	Human physical and behavioural components
9	SST.2007.4.1-3	Crisis management and rescue operations
10	SST.2007.4.1-4	Integral system solutions for safety

## 2. The Low Energy, Low Emission Ship

New efficient propulsion technology is integrated into innovative hull forms to dramatically reduce power requirements. Diverse power supplies are derived from ultra-low emissions prime movers, fuel cells and renewable sources. Hybrid drives and intelligent power networks maximise the efficient use of energy.

Table 3.As a result of Work Program related calls are identified according to Exploitation Outcome of The Low Energy, Low Emission Ship.

	Subprogram area	Topic
1	SST.2012.1.1-1	Assessment and mitigation of noise impacts of the maritime transport on the marine environment
2	SST.2012.2.2-1	Innovative fleet for efficient logistics chain
3	SST.2012.5.2-5	E-guided vessels: the "autonomous" ship

4	SST.2011.1.1-1	Green retrofitting through optimization of hull-propulsion interaction
5	SST.2011.1.1-2	Retrofitting of existing ships with green technologies
6	SST.2011.1.1-3	Towards zero emission marine engines
7	SST.2011.5.2-3	Cost-effective modernization of the inland fleet for freight transport
8	SST.2011.5.2-3	Cost-effective modernization of the inland fleet for freight transport
9	OCEAN.2011-4	Knowledge-base and tools for regional networks of MPAs, integrated management of activities together with assessment of wind energy potential in the Mediterranean and the Black Sea
10	SST.2010.1.1-2	Energy efficiency of ships
11	SST.2010.1.1-4	Advanced after treatment solutions for mitigation of emissions from ships
12	SST-2008.1.1-8	New ship propulsion systems
13	SST-2008.2.1-4	Continental Shipping
14	SST.2007.1.1-2	Vehicle/vessel and infrastructure technologies for optimal use of energy
15	SST.2007.1.1-4	Electric ship technology
16	SST.2007.1.1-5	Clean and energy efficient marine diesel power trains
17	SST.2007.1.2-3	ECO-SHIP

### 3. The Autonomous Ship

Next generation modular control systems and communications technology will enable wireless monitoring and control functions both on and off board. These will include advanced decision support systems to provide a capability to operate ships remotely under semi or fully autonomous control.

Table 4. As a result of Work Program related calls are identified according to Exploitation Outcome of The Autonomous Ship.

	Subprogram area	Topic
1	SST.2012.5.2-6	E-Maritime in support of compliance management
2	SST.2012.5.2-5	E-guided vessels: the "autonomous" ship
3	SST-2008.4.1-3	Integral system solutions for safety
4	SST.2010.5.2-5	Upgraded maritime transport information management

### 4. The Sustainable Recreational Craft

By 2020, recreational craft will offer better performance and be safer than current vessels, with lower through life costs and less total environmental impact. They will be more



comfortable and easier to operate in crowded and difficult waters, all of which will ensure a greater market share for EU builders.

Table 5. As a result of Work Program related calls are identified according to Exploitation Outcome of The Sustainable Recreational Craft.

	Subprogram area	Topic
1	SST.2012.4.1-2	Safety of ships in Arctic conditions
2	SST.2012.5.2-3	Innovative structural and outfitting materials for ships including inland ships
3	SST.2011.1.1-1	Green retrofitting through optimization of hull-propulsion interaction
4	SST.2010.5.1-1	Improved through-life asset management through application of advanced production, retrofit and dismantling processes
5	SST-2008.1.3-1	Effects of climate change on inland waterway and transport networks
6	SST-2008.5.2-1	Innovative product concepts
7	SST.2007.4.1-4	Integral system solutions for safety

## 5. The Future Ship Designs for Short Sea Operations

Dedicated Short Sea Ships will be essential links in environmentally friendly, integrated transport chains in and around Europe. Fast, highly automated ship/shore interfaces enable the most effective use of transport routes and port infrastructures. Sophisticated links to shore-based and inland waterway transport modes will provide the most efficient and cost effective transport system to meet the challenges of growth.

Table 6. As a result of Work Program related calls are identified according to Exploitation Outcome of The Future Ship Designs for Short Sea Operations.

	Subprogram area	Topic
1	SST.2012.5.2-3	Innovative structural and outfitting materials for ships including inland ships
2	SST.2012.2.2-1	Innovative fleet for efficient logistics chain
3	SST.2012.2.2-2	Towards an implementation of the NAIADES Action Areas
4	SST.2011.5.2-3	Cost-effective modernization of the inland fleet for freight transport
5	SST.2010.2.1-2	Efficient interfaces between transport modes
6	SST.2010.5.2-4	Competitive continental shipping including port operations
7	SST.2008.1.3-1	Effects of climate change on inland waterway and

		transport networks
8	SST.2007.2.2-1	Promotion of inland waterway transport
9	SST.2007.2.2-2	Advanced RIS-based transport management solutions for the IWT sector
10	SST.2007.2.2-3	Promotion of short sea shipping and intermodality

## 6. The European Cruise Ship

The Cruise Ship built in European Yards will maintain its world leading position by providing the best passenger recreation facilities, matched with the highest safety and security standards, while achieving the lowest per passenger emissions.

Table 7. As a result of Work Program related calls are identified according to Exploitation Outcome of The European Cruise Ship.

	Subprogram area	Topic
1	SST.2012.4.1-2	Safety of ships in Arctic conditions
2	SST.2008.5.2-3	The competitive ship
3	TPT.2007.3	Transport contribution to improve competitiveness of European tourism

## 7. Seven Day Ship Design

By 2020 European yards will have developed a design environment enabling them to provide detailed designs in world leading minimum times, enabling the combination of ultimately tailor-made designs with minimal technical and commercial risk.

Table 8. As a result of Work Program related calls are identified according to Exploitation Outcome of Seven Day Ship Design.

	Subprogram area	Topic
1	SST.2012.4.1-1	Human element factors in shipping safety
2	SST-2008.2.1-4	Continental Shipping
3	SST-2008.4.1-1	Safety and security by design
4	SST-2008.5.2-3	The competitive ship
5	SST.2007.4.1-1	Safety and security by design
6	SST.2007.5.1-1	Competitive product development

## 8. Leading Shipbuilding

By 2020 European shipyards will have perfected the flexible production process and the capability for full process control over distributed production locations. Retooling for new

designs will be minimized, as will be time to market. European shipbuilders will be world leaders in energy efficient shipbuilding.

Table 9. As a result of Work Program related calls are identified according to Exploitation Outcome of Leading Shipbuilding.

	Subprogram area	Topic
1	SST.2012.5.2-3	Innovative structural and outfitting materials for ships including inland ships
2	SST-2008.5.2-2	Competitive transport operations
3	SST-2008.5.2-3	The competitive ship
4	SST.2007.1.2-1	The greening of transport-specific industrial processes
5	SST.2007.1.2-3	ECO-SHIP
6	SST.2007.5.1-1	Competitive product development
7	SST.2007.5.1-2	Cost effective manufacturing and maintenance
8	SST.2007.5.1-3	New production organisations and models

## 9. Energy Transport in Extreme Conditions

New highly specialized vessel types will be produced by the European shipbuilding and offshore industries to meet the challenge of extreme conditions. The economic transport of energy to Europe from harsh climates and “hitherto un-navigable” waters will be possible.

Table 10. As a result of Work Program related calls are identified according to Exploitation Outcome of Energy Transport in Extreme Conditions.

	Subprogram area	Topic
1	SST.2012.4.1-2	Safety of ships in Arctic conditions

## 10. Intelligent Integrated Transport Network

A secure Web-based system of vessel and cargo tracking will be accessible to all operators and users, with unified rules for the transport of goods within the EU-27. Integrated ICT (Information and Communication Technologies) and ITS (Intelligent Transport Solutions) will enable efficient planning, booking, simulation, routing and control of cargo across different transport modes.

Table 11. As a result of Work Program related calls are identified according to Exploitation Outcome of Intelligent Integrated Transport Network.

	Subprogram area	Topic
1	SST.2012.2.2-1	Innovative fleet for efficient logistics chain

2	SST.2011.5.2-3	Cost-effective modernization of the inland fleet for freight transport
3	SST.2010.1.1-1	Carbon footprint of freight transport
4	SST.2010.2.1-2	Efficient interfaces between transport modes
5	SST.2010.5.2-5	Upgraded maritime transport information management
6	SST-2008.2.1-5	Co-modal IT transport solutions
7	SST.2007.2.1-1	Vehicle/vessels and infrastructure concepts for intermodal freight transport
8	SST.2007.2.1-2	Benchmarking logistics
9	SST.2007.2.2-2	Advanced RIS-based transport management solutions for the IWT sector
10	SST.2007.2.2-4	Maritime and logistics co-ordination platform

### 11. Intermodal Waterways

The shipbuilding industry will provide collision proof ship designs with optimal hydrodynamic properties for maximum size transport units, with reduced risk and increased efficiency for new fleets of inland waterway vessels. New designs for integrated logistic concepts for Containers, Tankers, RoRo, Bulk and General Cargo enable cost effective transshipment between transport modes. Increased transport of goods on the inland waterways relieves congestion on road and rail, fostering incentives for international industrial investment.

Table 12. As a result of Work Program related calls are identified according to Exploitation Outcome of Intermodal Waterways.

	Subprogram area	Topic
1	SST.2012.2.2-1	Innovative fleet for efficient logistics chain
2	SST.2012.4.1-1	Human element factors in shipping safety
3	SST.2012.5.2-6	E-Maritime in support of compliance management
4	SST.2010.5.2-4	Competitive continental shipping including port operations
5	TPT.2010-4	Optimisation and integration of R&D efforts for transport of passengers by enhanced intermodality
6	TPT.2010-5	Demand/supply management and logistics for transport of passengers through increased co-modality and understanding of social behaviour
7	SST.2007.2.1-1	Vehicle/vessels and infrastructure concepts for intermodal freight transport
8	SST.2007.2.1-3	Smart supply chain management in intermodal door-to-door container transport
9	SST.2007.2.2-3	Promotion of short sea shipping and intermodality

## 12. Accelerated Sustainable Port Development

A streamlined open planning process enabling efficient and timely infrastructure development. The impacts of natural causes and events, as well as by human intervention – construction, operations, etc. – have been benchmarked for judgment and comparison.

Table 13. As a result of Work Program related calls are identified according to Exploitation Outcome of Accelerated Sustainable Port Development.

	Subprogram area	Topic
1	SST.2011.2.1-1	Efficient interfaces between transport modes
2	SST.2010.4.1-1	Safety and security by design in transport stations and terminals
3	SST.2008.1.1-2	Vehicle/vessel and infrastructure technologies for optimal use of energy

## Framework Program Topics that haven't materialized

In Waterborne it possible that research gaps can occur also when topics in research programs don't receive appropriate submissions. Underneath have been listed topics from Framework Program 7 in Transport Work Program that has not been started at all. The data is according to CORDIS - Community Research and Development Information Service which is an information space devoted to European research and development (R&D) activities and technology transfer.

Table 14. Topics of 7<sup>th</sup> Framework Program that did not materialized after call.

	Subprogram area	Topic
1	SST.2007.5.1.3	New production organisations and models
2	SST.2007.1.2.3	ECO-SHIP
3	SST.2008.2.1.4	Continental shipping
4	SST.2010.1.3-1	Transport modelling for policy impact assessments
5	SST.2010.2.1-2	Efficient interfaces between transport modes
6	SST.2010.5.2-4	Competitive continental shipping including port operation
7	SST.2010.6-2	Maritime industry knowledge network
8	SST.2011.5.2-1	Strengthening the European maritime transport sector competitiveness
9	SST.2011.5.2-4	Exploring and fostering international collaboration in the waterborne transport sector

In the table above is seen topics that haven't been realized because of lack of submissions or submissions weren't good enough in evaluation. Research gaps are remarkable because topics already are from themes and Exploitation Outcomes that haven't been stressed. The data was of 7<sup>th</sup> Framework program's four first calls. Results of fifth call have not been published yet, so topics of year 2012 couldn't be taken into account.

## Conclusions

As MARTEC II strives to fill research gaps that Framework program possible creates and Waterborne TP is showing themes that industry sees essential can research gaps be found. In this study the aim has been to find themes that haven't been stressed enough and themes that MARTEC II could utilize in thematic calls in years 2013 and 2014.

As from results of the study can be seen some Exploitation Outcomes are clearly more stressed than others. Themes like The Autonomous Ship, The European Cruise Ship, Seven Day Ship Design, Leading Shipbuilding, Energy Transport in Extreme Conditions and Accelerated Sustainable Port Development would need more attention and research resources in European level in order to facilitate their development. This means that traditional shipbuilding industry and new ways to produce and transport energy would need more attention. MARTEC II could build thematic calls round these themes.

The whole sector can also benefit that MARTEC II can fill research gaps in European level as for MARTEC II can be created smaller and more focused consortiums than for example in Framework Programs and their calls.