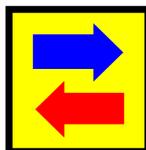
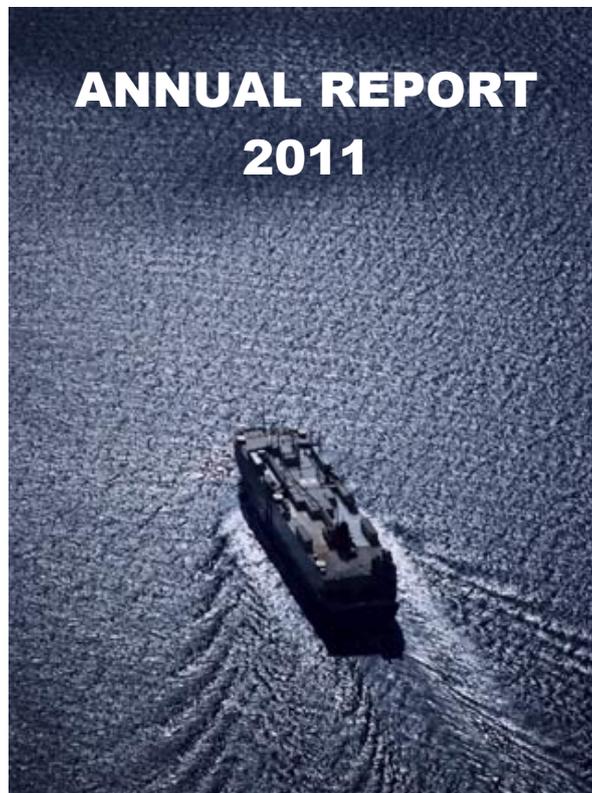




**NATIONAL TECHNICAL UNIVERSITY OF ATHENS  
SCHOOL OF NAVAL ARCHITECTURE AND MARINE ENGINEERING  
DIVISION OF SHIP DESIGN AND MARITIME TRANSPORT**

## **LABORATORY FOR MARITIME TRANSPORT**



<http://www.martrans.org>

October 2012

Laboratory for Maritime Transport  
National Technical University of Athens  
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*Dear LMT friends,*

This is the fourth year that an Annual Report of the Laboratory for Maritime Transport (LMT) at NTUA is being produced. This one gives a general picture of what happened in 2011. I have to apologize for the delay in having this report produced. If any excuse can be put forward, this is due to an extremely hectic schedule in 2012.

In a sense, 2011 seems already far away and in a sense some of the activities then were superseded by later events. For the record however, that year was again a year full of action for our Laboratory and therefore is worthy of note. Among other things, it was a year that proved very important for EU project SuperGreen, which LMT coordinates. Also, the new Centre of Excellence in Ship Total Energy-Emissions-Economy, in which LMT is involved and is funded by The Lloyd's Register Educational Trust, entered its second year. There have also been numerous other LMT activities, at the IMO, at the EU, and elsewhere.

A companion document to this report has been produced a few months ago and can be downloaded from LMT's web site ([www.martrans.org](http://www.martrans.org)). It is called the "LMT Thesaurus" (nickname: the bible). Whereas an Annual Report refers to a specific year, the Thesaurus is a compendium of a broad spectrum of facts on LMT and its people. It is intended to be updated on a regular basis.

We hope that you will find the contents of this report interesting, and any comments are welcome.

All the best,

Harilaos N. Psaraftis  
Professor, NTUA  
Director, LMT

Zografou, October 2012



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## 1. INTRODUCTION

### 1.1 About LMT

The establishment of the Laboratory for Maritime Transport (LMT) was officially approved by the National Technical University of Athens (NTUA) Senate in May 2006. Until then, and since 1989, LMT functioned as a research and educational unit within the School of Naval Architecture and Marine Engineering (NAME), known as "NTUA Maritime Transport". LMT holds a long-standing experience in the design, development and simulation of maritime and intermodal transport, marine environmental protection, safety analysis and human elements. Following Greece's rich maritime tradition, LMT is active in practically all areas of maritime transport R&D, having completed or being involved in projects in areas such as technology, management, economics, logistics, telematics, human aspects, environment, and safety. It has also been involved in projects and studies with a substantial policy analysis element. Linking R&D with education, LMT is also fully active in the School's undergraduate and post-graduate educational programs.



### People

#### Faculty Members

Harilaos N. Psaraffis (Professor)  
Dimitrios V. Lyridis (Assistant Professor)  
Nikolaos P. Ventikos (Assistant Professor)

#### Doctoral Candidates

Stefanos Chatzinikolaou  
Nikolaos Gavriilidis  
Stelios I. Iordanis  
George Kokkalas  
George Lykos  
Nikolaos Manos  
Eirini Stamatopoulou  
Vassilios Zagkas

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Christos A. Kontovas  
Panagiotis Zacharioudakis  
Apostolos G. Psarros

#### Other Research Staff

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You are warmly encouraged to visit our website ([www.martrans.org](http://www.martrans.org)) for further information and to contact us about your enquiries by email at [ntua\\_lmt@naval.ntua.gr](mailto:ntua_lmt@naval.ntua.gr) or for other contact options at <http://www.martrans.org/contact.htm>. Your feedback will be highly valued.

### 1.2 About this report

This report is a summary of LMT's achievements and activities during calendar year 2011. LMT's electronic newsletters inform regularly during the year about current and forthcoming activities and you can find them, as well as subscribe to our emailing list, at <http://www.martrans.org/news.htm>.

## 2. YEAR 2011 HIGHLIGHTS

### 2.1 Project SuperGreen achieves critical progress



The SuperGreen project continued into its second year with a flurry of activities, including a great number of events, some of them internal and most external. For more information (including all accepted project deliverables) please see the project's web site [www.supergreenproject.eu](http://www.supergreenproject.eu)

#### Regional workshops and breakthrough on corridor KPIs

The 2nd regional SuperGreen project workshop was cordially hosted by the Port of Antwerp on February 1, 2011. The event brought together around 70 stakeholders involved in green logistics. The workshop focused on two main topics: (a) effects of changes in operational and regulatory environment, and (b) progress made in benchmarking the green corridors.

In terms of the former, identified changes were grouped in seven categories (changes in business environment, trends in logistics, public policies, operations, infrastructure development, technology development and international regulations) and their effects were assessed using the key performance indicators (KPIs) already selected in previous stages of the project. In relation to corridor benchmarking, preliminary KPI results concerning transport chains using the Brenner corridor, our pilot case, were presented during the workshop.

The event was followed by the 1st annual EU review meeting of the project, held at the premises of Port of Gijon (Asturias House) in Brussels on February 2, and providing an opportunity to present and review work undertaken and results achieved by the project during its first year.

The combined 2nd General Assembly and 4th Project Management Committee meeting were held on the same day at the same place. The 21 participants, all project staff, had the opportunity to assess the EU review and the Antwerp workshop of the previous day, and plan imminent project activities.

The 3rd regional SuperGreen workshop took place in Malmoe, Sweden on March 10, 2011 and provided a forum for dissemination and discussion on topics such as the Swedish green corridor projects, progress on the KPIs and related methodology, and interim results on corridor benchmarking. The workshop, hosted by the Swedish Transport Administration, brought together around 80 participants. Discussions were focused on connecting the various green corridors projects both at a regional and European Union level so as to leverage the experience acquired from all of them.

Among the most important outcomes of this event were the finalization of the KPI set and the confirmation of the long term vision, which foresees that all freight transport corridors in Europe will become green and form a single integrated freight transport network that is driven by market needs. The workshop was closed by Mr. Pawel Stelmazczyk of the European Commission (DGMOVE), who gave an enlightening presentation of the expected evolution of the Green Corridors in the context of the new White Paper on transport policy and the revised TEN-T guidelines.

The set of recommended KPIs is given by the following table.

KPI	Input unit	Output unit	Assessment
<b>Efficiency</b>			
Absolute costs	ton, €	€/ton	3 Can manage without
Relative costs	ton, €, km	€/ton-km	1 Must have
<b>Service quality</b>			
Transport time	hours	hours	1 Must have
Reliability	Total number of shipments, On-time deliveries	%	1 Must have
ICT appl.	Availability, integration & functionality of cargo tracking & other services	graded scale	2 Prefer to have
Frequency	Services per week	number	1 Must have
Cargo security	Total number of shipments, Security incidents	%	2 Prefer to have
Cargo safety	Total number of shipments, Cargo safety incidents	%	2 Prefer to have
<b>Environmental sustainability</b>			
CO <sub>2</sub> emissions	ton, km	g/ton-km	1 Must have
NO <sub>x</sub> emissions	kg, km	g/1,000 ton-km	1 Must have
SO <sub>x</sub> emissions	kg, km	g/1,000 ton-km	2 Prefer to have
PM emissions	kg, km	g/1,000 ton-km	2 Prefer to have
<b>Infrastructural sufficiency</b>			
Congestion	ton, km, Average delay	hours/ton-km	2 Prefer to have
Bottlenecks	number & category	graded scale	2 Prefer to have
<b>Social</b>			
Corridor land use	Share of distance per area type	percent	2 Prefer to have
Traffic safety	Traffic safety incidents	percent	2 Prefer to have
Noise	Share of distance above level	percent	2 Prefer to have

The 4th regional SuperGreen workshop took place in Sines on March 24, 2011 and provided a forum of discussion with stakeholders in Portugal and the Iberian Peninsula. The workshop was hosted by the Port of Sines, Portugal's leading port in terms of volume of cargo handled, and SuperGreen partner PSA Sines, member of the PSA International Group, one of the leading global port operators with terminals in 28 ports in 16 countries across Asia, Europe, and the Americas.

In addition to being informed on the corridor benchmarking results, the approximately 60 participants had the opportunity to discuss the role of green technologies and smart ICT applications in greening freight corridors. As a successful example of this latter group, the Single Window System (JUP) of the Port Authority of Sines, which enables paperless administration, was presented to the participants who were able to watch it in action during the port tour they took.

At the end of May, the SuperGreen project held a pleasant two-day sequence of internal meetings in Trondheim, Norway, hosted by partner Marintek. The first day was dedicated to Work Package 5 (recommendations for R&D calls) and the second day was Project Management Committee meeting No. 5.

### Genoa plenary workshop

The second plenary SuperGreen workshop took place at Villa Pagoda, just outside Genoa, Italy on September 12, 2011. It attracted an audience of about 35 professionals in the area of green freight logistics. The objective was to present project results achieved thus far and obtain stakeholder feedback on a number of technical issues that can affect the economic, social and environmental sustainability of green corridors. Harilaos Psarftis and George Panagakos represented LMT in this event.

The project had already completed the benchmarking of selected corridors through a number of indicators like cost, time, reliability and frequency of services, and CO<sub>2</sub> and SO<sub>x</sub> emissions. It was now moving into expanding the benchmarking exercise so as to incorporate technical aspects like “green technologies” and smart Information and Communications Technology (ICT) applications. These two topics were the subject of the workshop’s two parallel sessions.

An extensive collection of green technologies to be applied in the selected corridors has been done with the purpose of making these corridors greener and solving the identified bottlenecks. Many innovative technologies have been identified in respect to road, rail, waterborne (inland waterway and maritime) and multimodal transport. Among them, 40 technologies were selected as the ones with the largest potential for the project. A Technology vs. Application matrix has been created to give the primary indications about possible technology application and an assessment of their greening potential. The first session of the workshop was dedicated to identifying the most promising technologies among them and the collection of data to be used for benchmarking corridors on the basis of applied technologies.

Along with the identification of green technologies, the role of ICT flows has been defined and exploited towards the goal of greener transport. The preliminary results achieved led to the classification of information flows and mode of usage. Major ICT clusters have been defined and application areas for greening via ICT have been selected. The second session of the workshop was dedicated to obtaining the stakeholders’ expectations on the effectiveness of a number of ICT systems in the event they were applied on selected corridors.

The two parallel sessions were followed by a discussion among representatives of key stakeholders and the audience.

The Advisory Committee (AC) of SuperGreen met with the Project Management Committee on September 13, 2011 at the premises of partner D’Appolonia in Genoa. Much of the discussion focused on feedback received during the workshop of the previous day and the difficulties in obtaining the data needed for a reliable corridor benchmarking. The AC meeting was followed by an internal Project Management Committee (PMC) meeting, which assessed the status of each work package of the project and reached decisions on further actions.

### **SuperGreen vis-à-vis TransEuropean Transport Networks (TEN-Ts)**

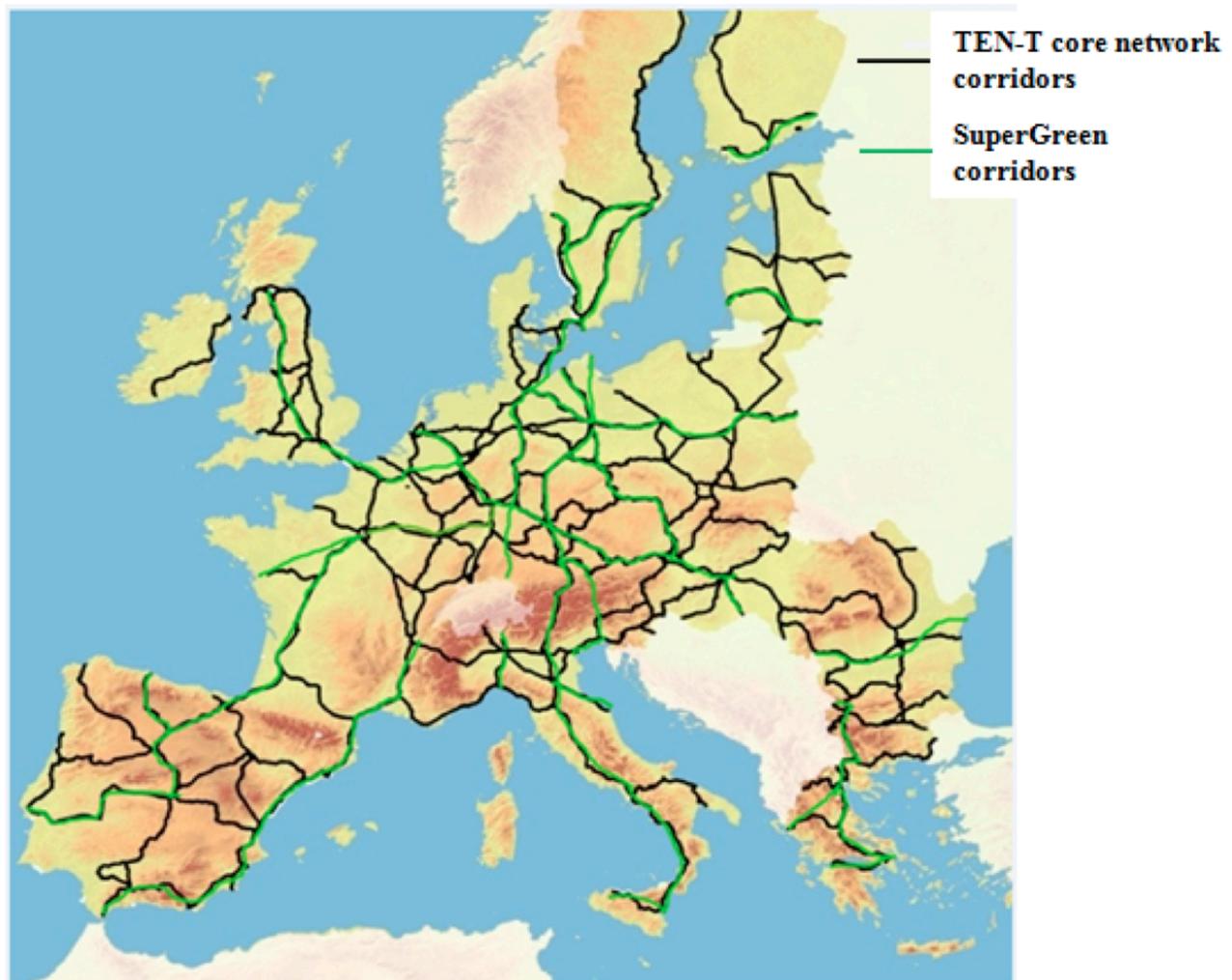
On Oct. 19, 2011 the European Commission published its proposal for a Regulation revising the guidelines for the development of the trans-European transport network (TEN-T) [COM(2011) 650/2]. The document aims at developing a complete TEN-T, consisting of infrastructure for railways, inland waterways, roads, maritime and air transport, pursued through two fields of action.

The first one concerns the ‘conceptual planning’ of the network for which a dual-layer approach has been selected, consisting of a comprehensive and a core network. The comprehensive network is, in large part, derived from the corresponding national networks and should be in place by 2050 at the latest. The core network overlays the comprehensive one and consists of its strategically most important parts. It constitutes the backbone of the European multimodal mobility network and should be completed by 2030 at the latest.

The second field of action concerns the implementation of the network. The Commission has developed the concept of ‘core network corridors’ as an instrument for the coordinated implementation of the core network. Core network corridors involve at least three transport modes, cross at least three Member States, cover the most important cross-border long-distance flows in the core network and, in general, include at least one maritime port and its accesses.

The proposed Connecting Europe Facility [COM(2011) 665/3], which will finance EU priority infrastructure in transport, energy and digital broadband, lists 10 core network corridors. The overlap that exists between the land part of the core network (plotted in black) and the 9 SuperGreen corridors (in green) is impressive, even after accounting for the fact that the priority

projects of the TEN-T were taken into consideration, among several other criteria, when selecting the SuperGreen corridors in June 2010.



A number of other characteristics concerning the nature and governance of the core network corridors resemble 'green corridor' features as they have been proposed in earlier SuperGreen project deliverables.

### Dissemination activities

2011 was particularly rich in dissemination activities for the SuperGreen project.

On March 9, 2011 Harilaos Psaraftis and George Panagakos represented SuperGreen in the Green Corridors joint workshop, organized by the four Swedish green corridor initiatives (East West Transport Corridor II, Scandria, Transbaltic and Øresund EcoMobility) in Malmö, Sweden as a preparatory meeting for the main SuperGreen event of the following day.

For the first time in its 15-month life, the SuperGreen project was presented to a Greek audience. On April 1, 2011, George Panagakos of LMT presented preliminary SuperGreen results during the "International Intermodal Freight Transport Open Conference", organised by the Design, Operations & Production Systems (DeOPSyS) Lab of the University of Aegean in the framework of the TRANSit project financed by the INTERREG MED programme. The conference that took place in Athens attracted policy makers, carriers, forwarders, public authorities, private companies, and other stakeholders.

By sheer coincidence and a couple of weeks later, Harilaos Psaraftis presented the SuperGreen project in another Athens conference, the International Ports and Hubs Trade Show and Symposium, organized by New Genesis SA.

Dimitrios V. Lyridis of LMT participated in the Balkans Intermodal & Logistics Conference organized on June 13-14, 2011, in Sofia, Bulgaria, where he also presented the results and expected outcome of the SUPERGREEN project.

SoNorA (South North Axis) is a 40-month transnational cooperation project financed by the Central Europe Programme of ERDF that aims at helping regions across Central Europe in developing accessibility in South North direction, between the Adriatic and Baltic seas. An integral and important part of SoNorA is the University Think Tank, a network of universities and transport scientists which, through the organisation of a series of conferences, provides methodological support to the project and reviews its core output.

Dimitrios V. Lyridis of LMT participated in an event that concerned knowledge management with clustered projects, where interim project results were presented and which was organized in the frame of SoNorA, which took place in Venice, Italy, on May 19-20, 2011. There he gave an overview of the SUPERGREEN project with emphasis on benchmarking of Green Corridors and the presentation instigated a lively discussion and caused a lot of interest.

The 8th SoNorA University Think Tank Conference, held on June 16, 2011 in Szczecin, Poland, was devoted to Transport and the environment, sustainable transport, and green corridors. George Panagakos of LMT presented the SuperGreen project and focused on the expected effects of identified changes in the operational and regulatory environment on the development of green corridors.

Three more presentations of the SuperGreen project took place in September 2011. One was on 6-7 September, in the context of conference "Green Corridors in the TEN Network", held in Trento, Italy and organised jointly by the Brenner Corridor Platform and Arge Alp (Working Community of the Alpine Regions - Autonomous Province of Trento). Another one was on 21-22 September, in the context of the "Green Corridor" conference organized by the Polish Presidency in Szczecin, Poland. And the third one was in Bayonne, France, in the context of the 2011 Atlantic Logistics Forum organized by the Aquitaine-Euskadi Logistical Platform.

### **Green corridors group on LinkedIn**

For those interested in green corridors, we created a Green Corridors group at LinkedIn. The link is [http://www.linkedin.com/groups/GREEN-CORRIDORS-GROUP-3831171?trk=myg\\_ugrp\\_ovr](http://www.linkedin.com/groups/GREEN-CORRIDORS-GROUP-3831171?trk=myg_ugrp_ovr)

## **2.2 LMT active in IMO business**

LMT's involvement in the activities of the International Maritime Organization (IMO) continued during 2011. Here we provide several highlights.

### **MBMs**

The third Intersessional Meeting of the Working Group on Greenhouse Gas Emissions from Ships took place from 28 March to 1 April 2011 under the chairmanship of Mr. Andreas Chrysostomou (Cyprus). More than 200 representatives from Member Governments and observer organizations participated in the five-day meeting. Professor Harilaos Psaraftis attended this meeting as a member of the Greek delegation. The purpose of this meeting was to consider the proposals on

Market Based Measures (MBMs) that are on the table since 2010. It is reminded that Prof. Psaraftis was a member of the MEPC Expert Group on MBMs last year.

Although Greece had not submitted an MBM of its own, Greece's comprehensive document (GHG WG 3/3), which was presented by Prof. Psaraftis suggested narrowing down the list of 10 MBM original proposals to just two groups: (i) the GHG International Fund proposal submitted by Cyprus, Denmark, the Marshall Islands, Nigeria and the International Parcel Tankers Association, and (ii) the 4 separate proposals by Norway, France, the United Kingdom and Germany, all based on an Emissions Trading Scheme (ETS). Among (i) and (ii), Greece expressed its strong support for group (i) and outlined the reasons for that preference.

Greece's proposal to eliminate some MBM proposals so that the list is narrowed down was forwarded to MEPC 62 for discussion. Greece's document GHG-WG 3/3, along with other IMO-related documents to which LMT has contributed can be downloaded from the following LMT site link: <http://www.martrans.org/limo.htm>

## MEPC 62

The 62<sup>nd</sup> session of IMO's Marine Environment Protection Committee (MEPC 62) held in London in mid-July 2011 will surely go down in history as the session in which IMO adopted EEDI, the ship's Environmental Efficiency Design Index. Irrespective of the pros and cons of EEDI, and of the debate that was held on the subject, those who witnessed first hand all the drama surrounding that decision can certainly claim 'I was there too'.

Three LMT people (Christos Kontovas, Nikos Ventikos and Harilaos Psaraftis, shown in the picture) were at MEPC 62, but for a different reason: to finalize the environmental risk evaluation criteria in Formal Safety Assessment (FSA). This capped some 4 years of deliberations on the subject, starting from MEPC 56, which had noted that the one matter that needed consideration within the context of the FSA Guidelines relevant to its work was the development of environmental risk evaluation criteria. In this connection, it recognized the need to carry out a more in-depth analysis of the proposed environmental risk evaluation criteria for the purpose of the FSA before inclusion of such criteria in the IMO FSA Guidelines. At stake was the use of the CATS criterion (for Cost to Avert a Tonne of Spilled oil). Noting that more work, including more research, was needed on the subject, MSC 56 agreed to establish a Correspondence Group (CG), under the coordination of Greece and the chairmanship of Prof. Psaraftis continued in the intersessional periods between successive sessions of the MEPC 56, 57, 58, 59 and 60.

At MEPC 60 (2010) a Working Group (WG) was established for the first time, again under Prof. Psaraftis's chairmanship. The major result there was the decision to abandon the constant CATS approach and go for a nonlinear CATS function. In fact, a function proposed by Greece (based on regression analyses of IOPCF data) was chosen among a set of nonlinear functions and was proposed for further testing. NTUA-LMT was the main contributor to this analysis.

At MEPC 62, another WG was established, and Greece was represented by LMT Assistant Professor N. Ventikos and PhD candidate C. Kontovas, whereas H. Psaraftis again chaired the WG. MEPC 62 agreed that a volume-based total spill cost functions could be appropriate to be used in environmental FSA studies.

## FSA Expert Group

Professor Psaraftis attended an FSA Expert Group meeting held at IMO headquarters on May 9-10, just prior to the 89th session of IMO's Maritime Safety Committee. The purpose of the meeting was to review the FSA study on general cargo ship safety, submitted by IACS. The meeting was chaired by Mr. Koichi Yoshida of Japan.

## 2.3 HELMEPA – LMT cooperation



Continuing a cooperation which started in 2008, the LMT participated in the Hellenic Marine Environment Association's (HELMEPA) series of training seminars during 2010. The LMT lecture covers in brief the basic theory of risk, risk analysis and risk engineering and analyzes maritime and occupational accidents. The 2010 lecture is focused more on the occupational aspect of safety, however it also provides practical guidance for the implementation of risk oriented approaches and methods to identify causes of accidents, including starting points and escalation factors, to assess accident producing conditions and to make realistic recommendations so that the maritime industry remains safe and environmentally friendly. Speakers from LMT at the HELMEPA seminar series were Stefanos Chatzinikolaou, and Nikos Ventikos.

## 2.4 The Encyclopedia of Earth (EoE)

Dr Nikos Ventikos was appointed as a Topic Editor for the Encyclopedia of Earth (<http://www.eoearth.org/>); the Encyclopedia of Earth is an electronic reference about the Earth, its natural environments, and their interaction with society. In this outline, it is a free, expert-reviewed collection of articles written by scholars, professionals, educators, and experts and targets to all sort of groups including students, scholars, professionals and the general public. In particular, Dr Ventikos was added at the topic editor group of OCEAN-OIL; OCEAN-OIL is a peer-reviewed collection of scientific information and educational resources about the 'Deepwater Horizon' disaster and its broader energy and environmental issues. In this context, Dr Ventikos will deal with issues related to oil spill risk analysis, oil spill confrontation and relative means, and spill response strategies.

## 2.5 TRANSTOOLS 3 kickoff meeting

Assistant Professor Dimitrios V. Lyridis participated in the kickoff meeting of project TRANSTOOLS 3, which took place in Lyngby, Denmark. The objective of the project is to upgrade and further develop the current TRANSTOOLS model, to a new and improved European transport demand and network model (TT3). The project leader is the Technical University of Denmark (Department of Transport) and LMT participates as a partner. More details in a future issue of our newsletter.

## 2.6 DG-Clima's WG on Ships

Professor Psaraftis attended the 2nd meeting of the European Climate Change Programme's (ECCP) Working Group on Ships, organized by the European Commission (DG-Clima) in Brussels in late June. This Working Group "Reducing greenhouse gas emissions from ships" aims at providing input to the Commission in its work to develop and assess options for the inclusion of international maritime transport emissions in the EU's greenhouse gas reduction commitment. Within this context, the specific objectives of this meeting was to present views, information, concerns and engage in an active discussion on relevant topics such as; possible measures, impacts, use of revenues and how to avoid evasion. Psaraftis gave a presentation on slow steaming vs. speed limits. The presentation can be downloaded from the LMT web site at this link: <http://www.martrans.org/documents/2011/Slow%20steaming%20Psaraftis%202011.pdf>

## **2.7 ECONSHIP 2011**

LMT participated with 4 staff members (Kontovas, Lyridis, Panagakos, Ventikos) and 4 papers (see the last section of this newsletter) at the European Conference on Shipping Intermodalism & Ports (ECONSHIP 2011), held on 22-24 June in Chios, Greece. The event was organised by the Department of Shipping, Trade and Transport (STT) of the University of the Aegean (Greece) under the auspices of the International Association of Maritime Economists (IAME) and was hosted by the "Maria Tsakos Foundation" International Center of Maritime Research and Tradition.

## **2.8 LMT attending meeting of experts at UNECE Geneva**

The LMT director was invited to a group of experts on climate change impacts and adaptation for international transport networks. The group was set up by the Transport Division of the United Nations Economic Commission for Europe (UNECE). A meeting of the group took place in Geneva, Switzerland on Nov. 8, 2011.

## **2.9 LMT present at INFORMS Charlotte**

Harilaos Psaraftis presented a paper on a specialized pick up and delivery problem at the annual meeting of the Institute for Operations Research and the Management Sciences (INFORMS) in Charlotte, North Carolina, USA in November. Travelling thousands of miles to this meeting proved to be a worthwhile experience, at least in terms of meeting with old friends and colleagues. More than 4,000 papers were presented at the conference. A version of that paper was accepted by and appeared in the European Journal of Operational Research (EJOR).

## **2.10 SNAME 2011 Annual Meeting**

During the annual meeting of the Society of Naval Architects and Marine Engineers (SNAME) in Houston in November 2011, Christos Kontovas presented a paper co-authored with N. Ventikos and H.Psaraftis related to the environmental risk evaluation criteria in Formal Safety Assessment. This was based on our work within the International Maritime Organization, an issue in which LMT was heavily involved during the last 4 years.

## **2.11 LMT director elected International Regional Vice President of SNAME**

At SNAME's annual meeting in Houston (November 2011) it was announced that Professor Psaraftis, SNAME Fellow, was elected International Regional Vice President of SNAME. There are two Vice Presidents from each of the Society's five Regions. One Vice President from each Region is elected every other year for a four-year term. The new position of International Regional Vice President started with only one vice president, but it is expected that there will be two in the future. The position of Regional Vice President was established by the Society to ensure a geographical diversity in the membership of the Executive Committee. Additionally, it is expected that the Regional Vice Presidents will assure improved two-way communication between members and the Executive Committee. RVPs serve two years on the Executive Committee and at the same time they are Council members for four years.

## 2.12 ELINT 2011 Annual Meeting

The Hellenic Institute of Marine Technology organized its Annual Meeting for the 5th consecutive year. A special section was devoted to selected papers that were presented by Greek researchers during the 2011 conference of the International Maritime Association of the Mediterranean (IMAM) that took place in Genoa, Italy on September. Amongst others, a paper co-authored by Kontovas, Ventikos and Psaraftis on estimating the cost of tanker oil spills was selected and presented by Dr. Ventikos.

## 2.13 Ventikos speaks on wreck removal

Dr. N. Ventikos gave an interview to Maritech – Maritime and Technology News on the developments and best practices of wreck removal; he focused on topics and work done with regards to wreck removal in the Laboratory for Maritime Transport of the National Technical University of Athens but he also spoke for wreck removal in general. More specifically, Dr. Ventikos explained in brief the most important methodologies and practices of wreck removal giving some advantages and disadvantages of all described methods and techniques. Moreover he analyzed the environment of wreck removal explaining the significance of the prevailing environmental conditions, the type of the bottom of the sea etc. Then Dr. Ventikos presented some characteristic examples of successful wreck removal operations that have been recorded in the international literature; namely he gave interesting details for the removal of the military submarine KURSK and the operation for the car carrier TRICOLOR. The interview of Dr. Ventikos can be found in volume 16 and pages 24 and 25 of the journal Maritech – Maritime and Technology News.

## 2.14 PhD Thesis Defense

The Ph.D. title was awarded on December 16<sup>th</sup>, 2011 to **Christos Kontovas** from LMT, who successfully defended his thesis entitled "Quantitative Risk Management Framework for Maritime Safety and Environmental Protection" under the supervision of Prof. Harilaos Psaraftis. The thesis is available on the LMT website.

### 3. EDUCATION

#### 3.1 Taught courses

- ECONOMICS OF MARITIME TRANSPORT I
- ECONOMICS OF MARITIME TRANSPORT II
- ECONOMICS OF MARITIME TRANSPORT III: Environment and safety analysis
- ELEMENTS OF FINANCE. SPECIAL TOPICS IN SHIPPING
- LOGISTICS IN MARITIME TRANSPORT
- RISK THEORY, ENGINEERING AND APPLICATIONS IN MARITIME TRANSPORT
- THE HUMAN ELEMENT - INTRODUCTION TO HUMAN RELIABILITY FOR MARITIME TRANSPORT
- WATERBORNE TRANSPORT SYSTEMS (postgraduate course)



#### 3.2 Diploma theses

Year	Name	Title	Supervisor
2011	Konstantinos Nikolaidis	Technologies of locating and tracking passengers in cruiseships	Nikolaos P. Ventikos
2011	Alexandros Koimtzoglou	Technical analysis and methodologies for wreck removal	Nikolaos P. Ventikos
2011	Andreas Andritsopoulos	Analysis of marine accidents in the Aegean Sea	Nikolaos P. Ventikos
2011	Konstantinos Louzis	Risk analysis for shipwrecks in Greek waters	Nikolaos P. Ventikos
2011	Ilias Valsamis	Feasibility study for a marina at the island of Symi	Nikolaos P. Ventikos
2011	Eirini Grigoriou	Development of a model for the estimation of oil spill waste generation	Nikolaos P. Ventikos
2011	Panagiotis Sotiralis	Probabilistic analysis of oil outflows from tankers : quantities and cost	Nikolaos P. Ventikos
2011	Christos Chrysavgis	Study and analysis of marine accident of general cargo ships	Nikolaos P. Ventikos
2011	Charalampos Panagakis - Panagopoulos	Inventory of air emissions form ships: model analysis for the island of Santorini	Nikolaos P. Ventikos
2011	Gerasimos Kofinas	Estimating the cost of oil pollution in Greek seas: implementation process of willingness-to-pay	Nikolaos P. Ventikos
2011	Stefanos Stergiou	Shipping stock simulation and establishment of the efficient set using a General Autoregressive Conditional Heteroscedasticity (GARCH) model	Dimitrios V. Lyridis
2011	Stefanos Baratsas	Modeling of optimal conditions for cost and CO <sub>2</sub> emissions reduction in containerships	Dimitrios V. Lyridis
2011	Antonios- Panagiotis Mergos	Relative Efficiency of shipping companies: A DEA Analysis	Dimitrios V. Lyridis
2011	Nikolaos Katzourous	The effect of oil prices and exchange rates in the bulk carriers freight market	Dimitrios V. Lyridis
2011	Ioannis Dalezios	Carbon exchange and calculation of carbon credits with the aim of reducing carbon emissions from ships	Dimitrios V. Lyridis
2011	A. Androutopoulos	Optimal purchasing strategy of oil products for ships	Dimitrios V. Lyridis
2011	Konstantinos Papagiannopoulos	Feasibility study of a yacht repair and storage unit	Dimitrios V. Lyridis
2011	Konstantinos Koulouris	Comparative assessment of a supply chain	Dimitrios V. Lyridis
2011	Kostas Drakos	Study and assessment of the maritime cluster of Shanghai (China)	Dimitrios V. Lyridis
2011	Irene- Asimina Stamatopoulou	New regulations for climate change: effect on modal shift and modal choice	Harilaos N. Psaraftis
2011	Georgios Papakostas	The Energy efficiency design index (EEDI)	Harilaos N. Psaraftis
2011	Evangelos Roditis	Estimating CO <sub>2</sub> emissions in a container terminal	Harilaos N. Psaraftis

## 4. RESEARCH PROJECTS

(listed alphabetically)



### 4.1 ABS – NTUA



Since mid-2008, LMT has been engaged in its first US-funded research in the form of a three-year project sponsored by the ABS under the name of “Assessment of Environmental Impact In Marine Transportation and Related Activities.” The project studies the impact of environmental protection regulations, practices or measures on marine transportation, including shipbuilding, and will integrate practical industry data and information with academic research. The intent is to develop tools that can be used by designers, ship owners and other stakeholders to identify and select effective environmental policies and procedures. The research focuses on two principal areas: environmental risk evaluation criteria and ship emissions and energy savings.

Regarding the first area, current approaches focus on risk evaluation and attempt to identify solutions and methodologies that take the environmental dimension into account, in particular pollution from oil spills. During 2010, various data regarding components of the cost of oil spills were analyzed. This work may be useful in evaluating alternative tanker designs and risk control options to reduce pollution risk.

The main objective of the second area is to develop a list of problems related to ship air emissions and energy savings. The analysis includes a birth-to-grave approach in which total emissions during ship’s lifecycle are assessed (i.e. shipbuilding, operation/maintenance, recycling). Comparisons of emissions generation are also made with maritime transportation scenarios (combinations of ship type, size, trip distance, fuel type, engine type, etc).

The project was completed in mid-2011.

### 4.2 Centre of Excellence in “Ship Total Energy-Emissions-Economy”

The Lloyd’s Register Educational Trust (The LRET) has established a Centre of Excellence in Ship Total Energy-Emissions-Economy. The Centre is housed at the School of Naval Architecture and Marine Engineering of NTUA.

The objective of this Centre of Excellence is to develop a holistic and interdisciplinary approach to the complex goal of increasing energy efficiency and reducing emissions, while not jeopardizing the economic viability of the shipping industry. The general objectives of the Centre are the creation, consolidation and dissemination of know-how in the area of Total Energy and Emissions Economy aiming for the highest standards of achievement in this sphere of activity. It is intended that this academic Centre will maintain close links with the Shipping Industry and specifically with the Greek Shipping Community.

The Centre's approach is interdisciplinary, as two Laboratories of the School will be involved: the Laboratory of Marine Engineering (LME) and the Laboratory for Maritime Transport (LMT). LME will focus at technical aspects of the project and LMT will focus on managerial-economic aspects. The Director of the Centre will be Professor C. Frangopoulos, whereas the tracks led by LME and LMT will be supervised by Professors N. Kyrtatos and H. Psaraftis, Directors of LME and LMT respectively.

### 4.3 ENVISHIPPING



The ENVISHIPPING project started in 17 May, 2011, after the successful completion of the acceptance and negotiations phases with the General Secretariat for Research and Technology of the Greek Ministry of Education. The consortium of the project brings together leading companies and institutions of the Greek maritime industry with the aim to explore the total environmental footprint of ships from a life cycle perspective. More specifically, the target of the project is the ship's life cycle assessment through which the identification and classification of all factors contributing to the environmental footprint of a ship during its life (building, operation/maintenance, recycling/dismantling) can take place. The work carried out in the initial phase of the project concerned the development of a unique framework established exclusively for the needs of Envishipping, which is adequate for the assessment of the total environmental footprint of ships. The effort currently is focusing on the creation of a database for all important ship pollution drivers (i.e. air emissions, solid and liquid wastes and garbage) per ship type and per each phase of the vessel's lifecycle. Except from LMT that is coordinating the work of the project, other partners are: POLYECO SA (leader company in integrated ship waste management services in Greece), the Hellenic Sea Ways, HSW (major Greek Ro-Ro shipping company), the Greek branch of Det Norske Veritas, the Hellenic Marine Environment Protection Association, HELMEPA (environmental NGO), the Naftotrade Shipping and Commercial SA, (Greek owned cement carriers company), and the Company for Shipping Development Support and Cooperation, NAFS (a non profit subsidiary of the Hellenic Chamber of Shipping).

### 4.4 SuperGreen

Please see section 2.1.

## 5. PUBLICATIONS

### 5.1 Papers in refereed journals

- Kontovas, C.A., H. N. Psaraftis (2011), "Reduction of emissions along the maritime intermodal container chain: operational models and policies," *Maritime Policy and Management* Vol. 38, No. 4, pp 451-469.
- Kontovas, C.A., Psaraftis, H.N. (2011), "Climate Change Policy in Shipping Focusing on Emission Standards and Technology Measures", *Environmental Engineering and Management Journal*, Volume 10, Issue 10, pp.1589-1596.
- Psaraftis, H.N. (2011), "A multi-commodity, capacitated pickup and delivery problem: The single and two-vehicle cases," *European Journal of Operational Research* 215, pp. 572–580.
- Zacharioudakis, P. G., S. Iordanis, D. V. Lyridis, H. N. Psaraftis (2011), "Liner shipping cycle cost modelling, fleet deployment optimization and what-if analysis," *Maritime Economics and Logistics* 13, pp. 278-297.
- Kontovas, C.A., H.N. Psaraftis, "The link between economy and environment in the post-crisis era: lessons learned from slow steaming," *Int. J. Decision Sciences, Risk and Management*, Vol. 3, Nos. 3/4, 2011, pp. 311-326.



### 5.2 Proceedings of refereed conferences

- Chatzinikolaou S.D., Ventikos N.P. (2011), "Sustainable maritime transport: An operational definition," IMAM 2011 conference, Genoa, Italy, Sep. 13-16. In "Sustainable Maritime Transportation and Exploitation of Sea Resources," E.Rizzuto and C. Guedes Soares (eds), CRC press, pp. 807-814.
- Kontovas C.A. and H.N. Psaraftis (2011), "The link between economy and environment in the Post-Crisis Era: Lessons learned from slow steaming", *European Conference on Shipping Intermodalism & Ports (ECONSHIP 2011)*, June 22-24, Chios, Greece
- Kontovas C.A., Ventikos N.P., Psaraftis H.N. (2011), "An updated analysis of IOPCF oil spill data: Estimation of the disutility cost of tanker oil spills," IMAM 2011 conference, Genoa, Italy, Sep. 13-16. In "Sustainable Maritime Transportation and Exploitation of Sea Resources," E.Rizzuto and C. Guedes Soares (eds), CRC press, pp. 807-814.
- Kontovas, C.A., Ventikos, N. , and Psaraftis H.N. (2011) ," Estimating the Consequence Costs of Oil Spills from Tankers, 2011 SNAME Annual Meeting & Expo, November 18-19, 2011 Houston, TX.
- Lyridis D.V and P. Zacharioudakis (2011), "Assessment of investment risk in Greek short sea shipping. A Ro-Ro passenger ferry case", *European Conference on Shipping Intermodalism & Ports (ECONSHIP 2011)*, June 22-24, Chios, Greece
- Lyridis, D.V (2011), 'The SuperGreen project', presented at the 2011 Atlantic Logistics Forum, organized by the Aquitaine-Euskadi Logistical Platform, Bayonne, France, Sep. 29.
- Panagakos G.P. and H.N. Psaraftis (2011), "Key performance indicators for green corridors in European freight Transportation", *European Conference on Shipping Intermodalism & Ports (ECONSHIP 2011)*, June 22-24, Chios, Greece
- Panagakos G.P., Psaraftis H.N. (2011), "Green corridors in freight logistics: How conducive is the operational and regulatory environment in Europe?", *Proceedings of the 8th SoNorA University Think Tank Conference, Szczecin, Poland, June 16, ISSN 1868-8411.*

- Panagakos, G.P and H.N. Psaraftis (2011), "The effects of regulatory changes on green freight corridors," IMAM 2011 conference, Genoa, Italy, Sep. 13-16. In "Sustainable Maritime Transportation and Exploitation of Sea Resources," E.Rizzuto and C. Guedes Soares (eds), CRC press, pp. 807-814.
- Ventikos N.P., Louzis K., Koimtzoglou A. (2010), "Shipwrecks vs. Environment in Greek Waters: Core Red or Fuzzy Alarm?", Proceedings of the 2010 Annual SRA Meeting: Risk Analysis in Action, Salt Lake City, Utah, CD-ROM
- Ventikos N.P., Louzis K., Koimtzoglou A. (2011), "A Fuzzy Logic Approach to the Emerging Risk from Shipwrecks: the Exercise in Greek Waters", Proceedings of the Conference Beyond Experience in Risk Analysis and Crisis Response (RACR 2011), Advances in Intelligent System Research, Atlantic Press, Vol. 16, Laredo, TX, pp. 160-165.
- Ventikos N.P., Swtiralis P. (2011), "Probabilistic oil outflow: the Tanker Fleet in the Context of Risk Analysis", European Conference on Shipping Intermodalism & Ports (ECONSHIP 2011), June 22-24, Chios, Greece
- Ventikos NP and Panagakis-Panagopoulos C. 2011. Inventory of air emissions from ships: model and analysis in local scale. Book of Maritime Transport, vol 5, pp 111-124, Athens, Greece.

### 5.3 Other conferences

- Panagakos G.P., Psaraftis H.N. (2011), "Green corridors in the EU transport policy", Proceedings of the 9th SoNorA University Think Tank Conference, Bologna, Italy, October 19, ISSN 1868-8411.
- Panagakos G.P., Psaraftis H.N. (2011), "Green Corridors and the SuperGreen project: First results", presentation at the Green Corridors in the TEN Network Conference, Trento, Italy, September 6, 2011.
- Psaraftis, H. N. (2011), "Sustainable shipping: parallel tracks that meet," presentation at Mare Forum's Blue Shipping Summit 2011, Athens, Greece, June 6.
- Psaraftis, H.N. (2011), "Green intermodal logistics and the SuperGreen project", International Ports and Hubs Trade Show and Symposium, Athens, Greece, April 13-15.
- Psaraftis, H.N. (2011), "Slow steaming vs. speed limits," presentation at ECCP DG-Clima's WG on Ships, Brussels, Belgium, June 22-23.
- Psaraftis, H.N. (2011), "The SuperGreen project: overview and first results," presented at Green Corridors – Multimodal Sustainable Transport System' conference organized by Polish Presidency, Szczecin, Poland, Sep. 21-22.
- Psaraftis, H.N., "A Multi-commodity Capacitated Pickup and Delivery Problem: The Single and Two-vehicle Cases," INFORMS 2011 Annual Meeting, Charlotte, NC, USA, Nov. 13-16, 2011.
- Psaraftis, H.N., "The Quest for Greener Shipping," lecture at the Massachusetts Institute of Technology, Cambridge, MA, USA, Nov. 17, 2011.

### 5.5 Other publications

- Ventikos N.P., Louzis K. (2011), "Shipwrecks and oil pollution in Greek waters: the Study, the Results and the Perspective", Maritech News, Vol. 12, pp. 86-89. (in Greek)
- Ventikos NP and Grigoriou E. 2011. Presentation of selected marine accidents that led to oil pollution. Maritech – Maritime and Technology News, vol 16, pp 16-20.
- Ventikos N.P., Lykos G. (2011), "Can there be a systematic assessment of non-technical skills in maritime transport? The framework, the analysis and the results", Naftika Chronika, Vol. 141, pp. 68-72. (in Greek)

## • EVENTS CALENDAR

### Meetings and Events attended by LMT staff

- InnoSuTra 2nd Dissemination Event, Athens, Greece, Jan. 21
- SuperGreen 2nd regional workshop, Antwerp, Belgium, Feb. 1
- SuperGreen General Assembly, Project Management Committee, EU review meeting, Brussels, Belgium, Feb. 2
- "2nd Annual Capital Link Greek Shipping Forum", Athens, Greece, Feb. 22
- Green corridors joint workshop, Malmoe, Sweden, March 9
- SuperGreen 3rd regional workshop, Malmoe, Sweden, March 10
- SuperGreen 4th regional workshop, Sines, Portugal, March 24
- Transtools 3 project kickoff meeting, Lyngby, Denmark, March 24 - 25
- 3rd Intersessional meeting of the Working Group on Greenhouse Gases, IMO, London, March 28 - April 1
- TRANSit International Intermodal Freight Transport Open Conference, Athens, Greece, April 1
- International Ports and Hubs Trade Show and Symposium, Athens, Greece, April 13-15
- SuperGreen WP4 workshop, Athens, Greece, May 5
- IMO FSA Expert Group Meeting, London, UK, May 9-10
- SoNorA Event, Venice, Italy, May 19-20
- SuperGreen WP5 workshop, Trondheim, Norway, May 30
- SuperGreen PMC meeting, Trondheim, Norway, May 31
- Mare Forum 1<sup>st</sup> Blue Shipping Summit, Athens, Greece, June 6
- The Challenge of Maritime Piracy and Collaborative means for Counteraction, Athens, Greece, June 9
- Balkans Intermodal & Logistics Conference, Sofia, Bulgaria, June 13-14
- 8th SoNorA University Think Tank Conference, Szczecin, Poland, June 16
- Pireas 2011 - The 5th International Shipbrokers Forum, Athens, Greece, June 16
- 2nd European Maritime Research and Innovation Policy Conference, Brussels, Belgium, June 16
- ECCP WG Ships meeting, Brussels, Belgium, June 22-23
- European Conference on Shipping Intermodalism & Ports (ECONSHIP 2011), Chios, Greece, June 22-24
- MEPC 62 (Marine Environment Protection Committee), IMO, London, UK, July 11-15.
- Green Corridors in the TEN Network Conference, Trento, Italy, September 6-7.
- SuperGreen 2nd plenary workshop, Genoa, Italy, September 12.
- SuperGreen 3rd AC meeting, Genoa, Italy, September 13.
- SuperGreen 6th PMC meeting, Genoa, Italy, September 13.
- IMAM conference, Genoa, Italy, Sep. 13-16.
- Green Corridors conference, Szczecin, Poland, Sep. 21-22.
- 2011 Atlantic Logistics Forum, Bayonne, France, Sep. 29.
- UNECE meeting of group of experts on climate change impacts and adaptation for international transport networks, Geneva, Switzerland, Nov. 8, 2011.
- INFORMS 2011 Annual Meeting, Charlotte, NC, USA, Nov. 13-16, 2011.
- SNAME 2011 Annual Meeting & Expo, November 18-19, 2011 Houston, TX.
- ELINT 2011 Annual Meeting, Hellenic Institute of Marine Technology (ELINT), November 28 and 29, 2011, Athens, Greece.
- Lloyds List Greek Shipping Awards, Dec. 2, 2011, Athens, Greece.



• **2011 IN PICTURES**



*SuperGreen Malmoe workshop, March 2011*



*Walking downhill in Trondheim, May 2011*



*SuperGreen Sines workshop, March 2011*



*The FSA working group, May 2011*



*Working long hours: The WG on environmental risk evaluation criteria at MEPC 62, July 2011*



Intermission time at MEPC 62, July 2011



Christos Kontovas, Nikos Ventikos, Harilaos Psaraftis, Per Stefansson and Yasuhira Yamada at the Lemonia restaurant, London, July 2011



The Greek delegation at MEPC 62, July 2011



Project Officer Fleur Breuillin at SuperGreen Genoa workshop, September 2011



*SuperGreen Advisory Committee meeting, Genoa, September 2011*



*Foliage colors, Charlotte, NC, November 2011*



*Palais des Nations, Geneva, November 2011*