Dynamic European Maritime Clusters

Prof.dr.ir. Niko Wijnolst, editor

Europe is a maritime superpower as its maritime sectors are leading in terms of market shares, innovative technology and global operations.
However, European maritime industries are often fragmented, not only geographically, but also in terms of sectors and company size. In order to face the increasing global competition, in particular from the Far East, Europe should address these constraints and create a more integrated network and market of all the European maritime sectors, industries and entrepreneurs: not so much to defend its position, but most of all to take advantage of the abundant growth opportunities in global markets.

To achieve this, actions at various levels will be necessary. First of all the entrepreneurs should strengthen their (innovation) networks, create more economy of scale, either through cooperation with SME's or through consolidation, nationally and within Europe. The many maritime sectors should be strongly organised in clusters on national levels and on European levels. Strengthening the maritime clusters from within, as well as at the economic policy level are important enablers to address the competitive challenges.

The European Commission's initiative for a holistic European Maritime Policy underscores the importance of maritime clusters and integrated maritime policies. How can the European Commission contribute to the strengthening of European maritime clusters? Its first and foremost priority should be to understand the structure and economic importance of maritime clusters. As there are no standardized definitions of maritime sectors and clusters in Europe, and as statistics are not geared to measure and monitor maritime clusters, the European Union and member states should create a solid quantitative statistical foundation.

Without this basis, it will be difficult to formulate and monitor a future European Maritime Policy. This book contains various high-level contributions from a number of maritime clusters and policy makers which underline the necessity to do just that.

The European Network of Maritime Clusters is ready to assist the European Commission when it decides to commission an EU-wide study with the objective to establish a detailed insight in the European maritime cluster.

Dutch Maritime Network series
PUBLICATION No. 30

Delft University Press is an imprint of IOS Press

ISBN 1-58603-684-X

IOS Press

30

Dynamic European Maritime Clusters

Prof.dr.ir. Niko Wijnolst, editor

IOS Press

Dynamic European Maritime Clusters

Prof.dr.ir. Niko Wijnolst, editor

Maritimt Forum, Norway
and
Dutch Maritime Network

in cooperation with
European Network of Maritime Clusters

Dynamic European Maritime Clusters

DUTCH MARITIME NETWORK series [1]

1. De Nederlandse Maritieme Cluster: literatuuronderzoek en plan van aanpak economische impact studies
2. De Maritieme Arbeidsmarkt: vraag en aanbod van zeevaartkennis
3. De Nederlandse Scheepsbouw- en toeleveringsindustrie: economische betekenis en structuur
4. De Nederlandse Offshoresector: economische betekenis en structuur
5. De Nederlandse Binnenvaartsector: economische betekenis en structuur
6. De Nederlandse Waterbouwsector: economische betekenis en structuur
7. De Koninklijke Marine: economische betekenis en structuur
8. De Nederlandse Visserijsector: economische betekenis en structuur
9. De Nederlandse Watersportindustrie: economische betekenis en structuur
10. De Nederlandse Maritieme Dienstverlening: economische betekenis en structuur
11. De Nederlandse Maritieme Toeleveranciers: economische betekenis en structuur
12. De Nederlandse Zeehavensector: economische betekenis en structuur
13. De Nederlandse Maritieme Cluster: economische betekenis en structuur
14. Het Maritieme Clustermodel: modellering en scenarioanalyse
15. De Nederlandse Maritieme Cluster: beleidsaanbevelingen
16. De Innovativiteit van de Nederlandse Maritieme Cluster
17. Maritieme Websites en E- Business: een verkenning
18. Maritiem Kapitaalforum: onderzoek naar de werking van de kapitaalmarkt in de sector van maritieme toeleveranciers
19. An International Shipping Company in the Netherlands: the tax perspective
20. E-business in de Maritieme Cluster: visies, strategieën, activiteiten
21. De arbeidsmarkt in de Nederlandse Maritieme Cluster; een overzichtsstudie
22. Leader Firms in de Nederlandse Maritieme Cluster: theorie en praktijk
23. De Koninklijke Marine als maritieme leader firm
24. De Nederlandse maritieme cluster: monitor en dynamiek
25. European Maritime Clusters: Global trends, theoretical framework, the cases of Norway and the Netherlands, policy recommendations
26. a. Rules for Commercial Cruising Vessels
    b. Voorschriften voor Commercial Cruising Vessels
27. Monitor Maritieme Arbeidsmarkt 2003
28. Dutch Maritime Research, Development and Innovation Expenditure
29. European Maritime Policy Conference; Proceedings
30. Dynamic European Maritime Clusters

Foundation Dutch Maritime Network

The Foundation was founded on June 27, 1997 with the objective to promote and strengthen the maritime cluster of the Netherlands.
The Members of the Board of the Foundation are N. Wijnolst (chairman), G.W. Bos (vice-chairman), F.G.M. Conyn (secretary and treasurer) and furthermore in alphabetical order, D. Alewijnse, K. Damen, C.J. van den Driest, C. van Duyvendijk R. van Gelder, J.W. Kelder, G.J. Kramer, B.J. Odink, T.G. Muller, S.M.T. Schipper, H.N.J. Smits, D.P.M. Verbeek.
The managing director of the Foundation is H.P.L.M. Janssens.
The address of the Dutch Maritime Network is Beurs-World Trade Center, Beursplein 37 P.O. Box 30145, 3001 DC Rotterdam, the Netherlands. tel. +31 (0)10-205.27.20, fax +31 (0)10-205.53.07, e-mail: info@dutch-maritime-network.nl, website: forum.dutch-maritime-network.nl

[1] Most books have an English summary, see also http://forum.dutch-maritime-network.nl, communicatie - NML serie

Dynamic European Maritime Clusters

Edited by Prof.dr.ir. Niko Wijnolst

Published by
Maritimt Forum, Norway
and
Dutch Maritime Network

in cooperation with
European Network of Maritime Clusters

August 2006

Published by IOS Press under the imprint Delft University Press

IOS Press BV
Nieuwe Hemweg 6b
1013 BG Amsterdam
the Netherlands
Telephone +31-20-688 3355, Telefax +31-20-687 0019
email: info@iospress.nl
www.iospress.nl
www.dupress.nl

For further information, contact:

Maritimt Forum
P.O.Box 1452, Vika, N-0116 Oslo, Norway
Telephone +47 22 4015 50/69, Telefax + 47 22 415721
e-mail: rikke.lind@rederi.no
website: www.maritimt-forum.no
Managing Director: Mrs Rikke Lind

Dutch Maritime Network
P.O.Box 30145, 3001 DC Rotterdam, the Netherlands
Telephone +31 (0) 10 205 27 20, Telefax +31 (0) 10 205 53 07
e-mail: info@dutch-maritime-network.nl
website: forum.dutch-maritime-network.nl.
Managing Director: Henk P.L.M. Janssens

CIP-Data Koninklijke Bibliotheek, The Hague, the Netherlands

Dynamic European Maritime Clusters

IOS Press
ISBN 1-58603-684-X
References: Maritime Clusters, Maritime Policy, Green Paper, Policy Recommendation

Contents

Preface 1 - The challenges for the Norwegian Maritime Industries

Activities related to the sea have long traditions in Norway and a great variety of maritime industries have been developed. The maritime industries in Norway as well as in the European Union are organised in Maritime Forums. As a non-European Union-member the close relationship between the Norwegian Maritime Forum and the European counterparts is essential. The Maritime Industries Forum plenary sessions provide an excellent forum for these dialogues, and we are pleased to host the conference in Oslo on 5-6 October 2006. This is the first time this conference is held in Norway.

The European Commission has launched a Green Paper for an Integrated Maritime Policy for the Union. The approach in the Green Paper is to combine economic growth with effective protection of the environment. The Green Paper aims to launch a debate about important challenges the future European Maritime Policy. The Green Paper will be debated in a number of events and will also be the main topic for discussion at the Maritime Industries Forum Oslo Conference.

The Green Paper covers sectors such as shipping, shipbuilding, tourism, fisheries and offshore oil and gas production. These are all important sectors for Norway. Norway will take an active part in this debate because it touches upon our vital interests.

Europe has a huge maritime economy with a strong global position. The challenge we are faced with is how to maintain the leading position of Europe in the maritime industries in a globalised economy. Key to this challenge is stimulating entrepreneurship and innovation through scientific knowledge and a well educated and experienced workforce.

This challenge is of particular relevance for Norway where we are proud of having a comprehensive maritime cluster. This cluster stretches from shipping companies to shipbuilding and classification, manufacturing of ship equipment, ship broking, ship finance and insurance as well as maritime offshore activities. Norwegian maritime manufacturing constitutes 7-9 percent of the world market. Shipbuilding, maritime equipment industry and maritime service providers are world leading because of the closeness to the shipping companies.

We therefore welcome the efforts and initiatives on the European level in this respect. The Green paper process and the work by the Maritime Industries Forum are of crucial importance in order to develop successful policies both on the national and European level to the benefit of the national maritime clusters and thereby the European maritime cluster as a whole.
The Norwegian Government is currently developing national growth strategies for some business sectors where Norway has a comparative advantage; among those are the maritime industries. We believe that the potential for innovation and growth in these key sectors are higher than in other sectors. The strategy for the maritime sector will be developed within the framework of the work now taking place on the European level.

The European Union is the most important point of reference when it comes to trade and industry policies. Norway is integrated in the European Union internal market through the Agreement on the European Economic Area (EEA). We are pleased to have a comprehensive cooperation with the institutions of the European Union in the maritime sector, such as The European Maritime Safety Agency (EMSA) and the European Commission. We also wish to cooperate closely with the European Union in international fora such as the IMO to enhance the global quality standard of shipping through international rules and regulations.

Maritime transport is a truly global industry. Challenges in shipping therefore require international cooperation and global solutions. We need to ensure high global standards of safety and environment at sea. Norway supports the holistic approach to maritime management that is outlined in the Green paper. As a major maritime nation with a long and vulnerable coastline, enhancing safety and security and reducing maritime pollution associated with shipping is of great importance to Norway.

The High North will be an area of particular strategic importance for Norway for many years to come. The Norwegian government is developing a coherent policy, which takes into account environmental concerns and sustainable fisheries management as well as the economic opportunities of the petroleum sector.

The Barents Sea has the potential to become an important source of energy supply to Europe and North America. The future increase in the petroleum activities in the North requires safe and modern oil rigs and supply ships. Norwegian Maritime Industries will take an active part of the development in the region. A comprehensive Government strategy for the High North will be presented this autumn. We see a need for greater international cooperation to face these issues. We are working closely with the Russians as well as with our European and American counterparts.

The European countries have a strong commercial environment and the necessary prerequisites to succeed in the various marine, maritime and offshore industries. The challenge is to maintain and develop a leading position for Europe and European companies in these activities. This will make a substantial contribution to fulfilling the aims of the Lisboa process. In order to succeed it is necessary that we join our forces and develop useful policies for our maritime industries.

Odd Eriksen
Minister of Trade and Industry, Norway

Preface 2 - European Maritime Clusters matter

The Dutch and the Norwegians share deep maritime roots and a love of the sea. Our histories, cultures and economies have been shaped by the part we've played in global shipping and trade. Just after the Second World War, we both ranked in the top five of shipping nations, based on tonnage. But in the seventies and eighties many new countries with different cost structures entered world shipping, making it hard for established maritime nations to compete. And things got worse when the shipping markets slumped dramatically in the mid-eighties. In order to survive, shipowners in countries like Norway and the Netherlands started to reflag their ships to independent, cheap registers – and even relocated their offices to low-cost countries.

This trend – which was the only way that shipowners could survive the slump – threatened the entire Dutch maritime cluster. A new, successful policy was in place by 1996, implemented by the transport ministry with the aid of the finance ministry. It wasn't easy to convince the European Commission to accept our proposals. But once it did, other countries quickly adopted the new measures. Now, ten years on, they are in effect the European standard.

The new policy revived the Dutch shipowning sector, boosting the shipbuilding sector. In turn that strengthened the marine equipment sectors, and so on. We witnessed the recovery of shipping – and its immediate and positive impact on the entire Dutch maritime cluster. We then encouraged the private sector to create the Dutch Maritime Network in 1997. My Ministry provided the initial funding for this organisation, which soon received support from the Ministry of Economic Affairs.

Now almost ten years on, we do not regret this step. The Dutch Maritime Network has proved its worth, not only within the Netherlands, but also at European level. This publication is clear evidence of that – as is the groundbreaking conference on European Maritime Policy of 17 November 2005 in Brussels, organised in close cooperation with the European Commission. My Ministry strongly supports efforts to strengthen the European Network of Maritime Clusters, as Europe has a strong position to defend. I am sure that the maritime cluster organisations can play a role here. The contributions in this publication show the progress that has been made in a few years time. This reassures me and encourages me to continue supporting the Dutch Maritime Network and its efforts, at home and abroad. I very much hope that my Norwegian counterpart – indeed, all my European Union counterparts – will follow this example. It allows us to have a sound economic policy without losing our historical and cultural roots. We know where we have come from, and that makes us all the more determined to steer for our destination – a bright maritime future.

Karla Peijs
Minister of Transport of the Kingdom of the Netherlands

Preface 3 - Towards a strong European Network of Maritime Clusters

The European Network of Maritime Clusters[2] was founded on 4 November 2005 in Paris by maritime organisations of ten countries, with the objective to learn from each other and to promote and strengthen the maritime clusters of member states and Europe as a whole. The basis for this founding session was created during a first meeting which took place in The Hague on 26-27 April 2004, and a joint-presentation of the various maritime clusters at the Maritime Industries Forum Plenary Session on 26 January 2005 in Bremen.

The European Network of Maritime Clusters organised itself as a flexible network in which members cooperate on a voluntary basis for issues related to their national agenda's, and in a more structured way for actions at the European level. This publication is a first public example of such an action which is part of an agenda that the European Network of Maritime Clusters wishes to undertake at the European level. It tries to convey at least two messages:

- The European maritime clusters are important parts of the member states' economies, and thus of Europe as a whole;
- The knowledge of the structure and economic importance of maritime clusters at a European level is still limited which makes it difficult to adequately articulate policy issues that are relevant for the European Commission's Green Paper debate.

For these reasons, the European Network of Maritime Clusters proposes the European Commission to undertake a second and in-depth study of the European maritime clusters, as the 2000 study was far from complete. The Green Paper, which specifically and very positively refers to the importance of maritime clusters, defines and creates a policy framework which will enhance the future prosperity of the maritime clusters. Therefore it is imperative that such an ambitious undertaking is based on common definitions of maritime sectors and clusters, as well as accurate and up-to-date figures. As these do not exist, we urgently ask the European Commission, in particular the Maritime Policy Task Force, to commission such a study during the year that the Green Paper will be debated (June 2006 – June 2007).

The members of the European Network of Maritime Clusters are able and willing to assist the Commission with such a study. Without a solid statistical basis, it will be difficult to define policies, and more importantly, to monitor developments and create policy feedback. The contribution from DG Enterprise in this publication on economic clusters underlines the importance of the cluster approach.

Niko Wijnolst, Chairman — Francis Vallat, Vice-Chairman

European Network of Maritime Clusters

[2] Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Poland, Sweden, United Kingdom

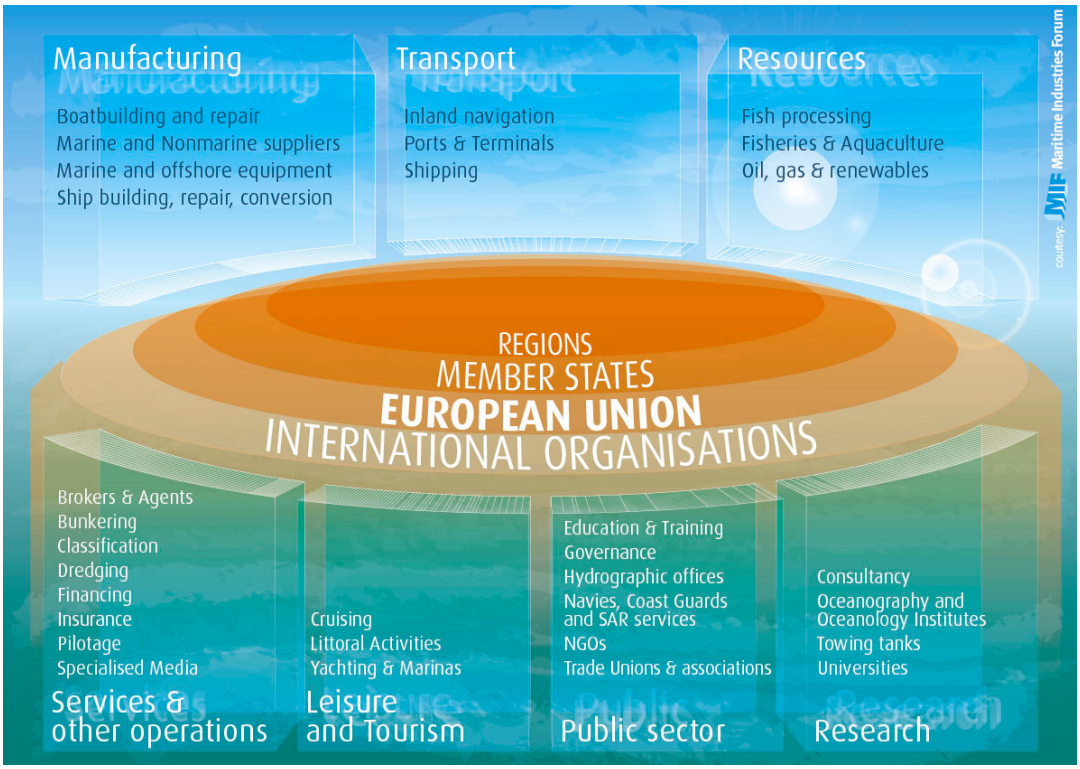
Introduction - Maintaining Europe's Maritime Superpower Status

Both Norway and the Netherlands have strong maritime clusters, based on centuries of involvement in shipping and trade. These maritime clusters have adapted constantly to the changes in international trade, foreign competition, technology and often have been at the forefront of global innovation. The newly industrialised nations, in particular in the Far East, have been challenging the established maritime nations in Europe. As the maritime cluster makes a major contribution to the economies of Norway and the Netherlands, and the global maritime markets demonstrate a continued growth, it is worthwhile to maintain the innovative dynamics and profit from the current strong positions in the maritime markets. How to do this? That is the subject of this book, jointly undertaken by the Norwegian maritime cluster organisation – Maritimt Forum – and the Dutch maritime cluster organisation – Dutch Maritime Network.
As this theme is not only relevant for Norway and the Netherlands, we have invited colleagues from Italy, France, Denmark and Germany to make a contribution as well. Apart from that, we have invited the European Commission, DG Enterprise, to present its views on cluster policy, in particular maritime cluster policy.

Why should we be concerned about the future of the European maritime cluster?
If we aggregate all the European maritime countries than there is only one conclusion possible: *Europe is a maritime superpower*. A strong position which warrants to be defended. The following examples will substantiate this claim.

- European ports handle 25% of world seaborne trade
- European shipowners own 40% of the world fleet
- 4 European containerlines are in the Top-5
- European shortsea shipping is 50% of world total
- European inland shipping has a modern fleet of 9.400 ships
- European shipbuilders have the highest turnover
- European shipowners order 40% of new buildings
- European marine equipment manufacturers produce 35% of the world market
- European offshore companies are world leaders in many segments
- European yachtbuilders produce 60% of the mega-yachts
- European dredging companies have 80% of the open market
- European maritime services, maritime research, inland shipping, fisheries, and navies are world leading

The European Commission has taken the initiative to formulate a European Maritime Policy and has published a Green Paper early June 2006. This ambitious project attempts to look at all the maritime activities and to link these into a coherent framework. The complexity and challenge of this task is clearly demonstrated in the following figure from the European Commission which outlines the scope of the project.



Maritime clusters form the backbone of the future European Maritime Policy and it is important that the European politicians become aware of the superpower status of maritime Europe. Therefore it is necessary to create a transparent picture of the economic contributions of maritime clusters to the European economy and to highlight policy measures that will strengthen its long term competitive position, for example in the domain of nautical and maritime education and training, maritime research and innovation, sustainability and safety, and so on.
A special chapter is devoted to the urgent need for an economic impact study of the European maritime cluster in order to appreciate the – until now – undervalued and under represented maritime clusters.

The fragmented European maritime industry is working hard to create a truly European maritime space. There is a clear convergence in shipping policies, there is exemplary cooperation in shipbuilding – LeaderShip 2015 – and there has been the establishment of the Waterborne Technology Platform which will contribute to the 7th RTD Framework Programme. European entrepreneurs act more and more as if they have accepted responsibility for their collective future.

In a virtually flat world, entrepreneurs and capital become fluid. Countries compete at a policy level to build up their maritime clusters as they wish to profit from the extraordinary growth potential. That is in itself logical, but we should not see this as a natural economic cycle. Maritime entrepreneurs have a choice which is not only motivated by profits. The culture of the home country is also important. One such shipping entrepreneur, Elizabeth Grieg from Norway, explains her way to deal with all the global challenges and pressures. But it is clear that the new European maritime

policy should be an opportunity for everyone who likes to live and work in Europe, to create the right long term framework conditions to do so.

We do hope that this collection of views of a high-level group of authors on the future of their maritime cluster and the future European Maritime Policy will stimulate the debate and will ultimately lead to a sound policy framework in which the entrepreneurial spirit of the dynamic maritime clusters will be bolstered. Only this way European welfare in its broadest sense will be served.

Terje J.K. Andersen
Chairman Maritimt Forum
Oslo

Niko Wijnolst
Chairman Dutch Maritime Network
Rotterdam

1. European Economic Clusters: the European Commission Perspective

by Paul L. Weissenberg[3]

1.1 Mission of the European Commission regarding European industry

The development of legislation and policies at European level has important impacts on enterprises in EU Member States and abroad. Legislation to create the Single Market, environmental legislation, trade policy, transfers for the agricultural sector and the various initiatives summarised under the expression Lisbon agenda lead to changing environments for businesses and necessitates a continuing dialogue with industry.

A vibrant, competitive industry is essential for Europe to sustain and increase its prosperity while meeting its wider social, environmental and international ambitions. Improving industrial competitiveness is crucial to ensuring the growth of Europe's economy.

The Enterprise & Industry Directorate-General aims to ensure that Community policies contribute to strengthening the competitiveness of all enterprises in the European Union. Particular attention is given to the needs of manufacturing industry and small and medium sized enterprises. The Directorate-General's task is on the one hand to develop cross-cutting policies, for example innovation policy, and on the other hand to foster and support activity in specific industry sectors, for example the development of technical standards or legislation for goods in a particular area.

In October 2005 the Commission published a Communication[4] outlining a new, more integrated industrial policy to create better framework conditions for manufacturing industries in the coming years. The new industrial policy will complement work at Member State level to support a strong and dynamic industrial base. It includes seven cross-sectoral initiatives which will benefit a wide range of industry sectors:

1. An intellectual property rights and counterfeiting initiative (start in 2006)
2. A High Level Group on competitiveness, energy and the environment (End 2005)
3. External aspects of competitiveness and market access (Autumn 2006)
4. New legislative simplification programme (October 2005)
5. Improving sectoral skills (2006)

[3] Dr. **Paul Weissenberg**, European Commission, DG Enterprise and Industry, responsible for Directorate for Aerospace, Security, Defence and Equipment, coordinator for Aerospace, Defence and Security

[4] COM(2005) 474 final of 5.10.2005 "Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing – towards a more integrated approach for industrial policy"

6. Managing structural change in manufacturing (End 2005)
7. An integrated European approach to industrial research and innovation (End 2005)

In addition, the Communication foresees the following initiatives targeting specific sectors:

- Setting up of a new pharmaceuticals forum (first meeting in 2006)
- Mid-term review of life sciences and biotechnology strategy (2006-2007)
- High-Level Groups on the chemicals industry (2007)
- European Space Programme
- Task force on the competitiveness of information and communication technologies (ICT) (2005/2006)
- Mechanical engineering policy dialogue (2005/2006)

It also focuses on investment in skills and equipping people for change. This industrial policy aims to support adaptability and structural change to boost the competitiveness of EU manufacturing, especially in the light of increasingly strong competition from China, India and other fast growing economies.

The majority of individual EU manufacturing sectors have performed well in comparison with their counterparts in other industrialised economies. Nevertheless, the present industrial structure of the EU economy as a whole makes it less than ideally positioned to face the ongoing globalisation process.

EU trade is still concentrated in sectors with medium-high technologies and low to intermediate labour skills. This exposes the EU to competition from producers in emerging economies. Hence, adaptability and structural change are critically needed if the EU is to maximise the gains arising from the integration in the world economy.

By conducting this new industry policy the Commission also stands by its commitment to contribute to a strong industrial base. To achieve this, it will take the necessary actions to improve the framework conditions for manufacturing industry and to ensure the consistency of various policy areas. The Commission regards coherence and synergies between different policies and better regulation as important tools to increase competitiveness of European industry.

The Commission's new approach will provide increased coherence and integration between policies to ensure a more powerful effect on competitiveness. In addition, the Commission will attempt to achieve a greater consensus over policy, by involving key stakeholders, social partners and Member States, at an early stage in policy making.

1.2 The European aerospace industry

a. STAR 21 – the Strategic Aerospace Review for the 21st Century[5]

Analyses of the 1990s showed that the European aerospace industry would not achieve sustained growth and competitiveness in the face of increasingly intense world competition through activities in a single Member State. Initiatives on European level would be needed to complement the existing excellence at the level of the firm[6]. Accordingly, over and above superior performance by individual firms, Europe needed to provide the context in which firms could flourish in the massive collaborative endeavours which constitute modern aerospace products and in providing the myriad of systems and supporting services which they need.

It was thus recognised that European aerospace in the next century would depend upon a vision for aerospace in Europe. The integration of action by the industry, Member States and the European Union would determine whether such a vision could be realised.

Against this background, in 2001 the Strategic Aerospace Review for the 21st century (STAR 21) was developed by a group of high-level experts coming from the areas of aeronautics, space and defence. Its aim was to identify challenges of the following 10-20 years and to identify priorities for action. It was felt that the European economic and industrial structure needed to change to respond to the high ambitions the European Union had set itself.

Based upon an assessment of the strategic role of the aerospace industry and its profile, STAR 21 identified five main areas which merited specific attention:

- Competing on world markets
- The operating environment for European aerospace
- European governance of civil aviation
- The vital need for European security and defence capabilities and
- Safeguarding Europe's role in space.

Overall, STAR 21 stressed the need for coherence and the integration of a variety of policy instruments. It called for improved access to third markets and the proper application of trade agreements, greater mobility for aerospace workers, further co-ordination of R&D efforts, an EU lead in all areas of civil aviation regulation, the completion of the single European sky and a closer relationship between the EU and the European Space agency in support of initiatives such as Galileo and the European space strategy.

[5] http://ec.europa.eu/enterprise/aerospace/index_en.htm, Communication COM(2003) 600 final of 13.10.2003 "A Coherent Framework for Aerospace – a Response to the STAR 21 report"

[6] See for example COM(1997) 466 final of 24.09.1997 "The European Aerospace Industry – Meeting the global challenge"

STAR 21 showed that the most significant progress had been made in areas in which an integrated European approach had been taken, and it demonstrated how the EU could play an important role in providing an environment in which industry could thrive.

b. ACARE – sectoral research cooperation[7]

STAR 21 identified common European research in the aerospace sector as one of the key challenges for the future. Research in aerospace is very long term and needs considerable amounts of money without any guarantee that the research project will ever lead to a final product to be sold on the market.

Parallel to the STAR 21 initiative, the Commission invited a high-level "Group of Personalities" from the air transport industry to reflect on the future of European aeronautics research. The group published a report in January 2001 "A Vision for European Aeronautics in 2020". In June 2001, ACARE (the Advisory Council for Aeronautics Research in Europe) was launched at the Paris Air Show by then European Research Commissioner, Philippe Busquin.

ACARE is one of the oldest European Technology Platform (ETPs). It comprises about 40 members, including representatives from EU Member States, EUROCONTROL, the European Commission, the European aeronautics industry and air transport operators. Like the other ETPs, ACARE's primary mission has been to define a Strategic Research Agenda (SRA). The SRA influences all European stakeholders in the planning of research programmes, particularly national and EU programmes. ACARE's activities include:

- The launch and approval of the SRA and periodical updates,
- Strategic and operational recommendations as well as commissioning studies for implementing the SRA and achieving the 2020 Vision,
- The evaluation of the overall results and benefits of the SRA for Member States, the Commission and stakeholders,
- Recommendation of measures for optimising the use of existing research infrastructures and achieving cost-effective investments,
- Recommendation of measures for improving educational policies to attract the scientists, engineers and other skills that the sector needs, and
- Development and implementation of a communication strategy to promote awareness of the SRA (within the stakeholders´ community as well as to larger public audiences) and to disseminate information on stakeholders' research programmes to facilitate consensus on priorities.

ACARE formally unveiled its comprehensive SRA in November 2002, addressing the challenges facing the European aeronautics industry. These include ever-increasing air traffic, with its associated increase in noise, emissions, congestion, and

[7] http://www.acare4europe.org/

delays, as well as heightened security concerns in the aftermath of the events of 11 September 2001. In March 2005, ACARE presented the second edition of its SRA, looking 20 years into the future and presenting expected or potential technology requirements in the air transport sector, based on a series of possible scenarios for the coming decades.

ACARE has been and remains a key guiding force in the planning of research under public, private, national and EU programmes. It is a unique platform comprising various stakeholders from the aeronautics industry as well as EU Member States. Its SRA has also served as a major source of input in the formulation of the aeronautics work programme of the Union's next Research Framework Programme (FP7). Major priorities remain the 'greening' of air transport, strengthening competitiveness and efficiency, and responding to the increasing demand for mobility and higher safety standards.

c. Aerospace clusters in Europe

With regard to the European maritime industry, and previous publications on that industry, it seems that there is a tendency to describe it as a continent wide cluster, "a type of cluster not recognised and discussed in previous research" [8]. For the aerospace industry it is much more common to speak of regional clusters, comprising centres of excellence of different aircraft or spacecraft parts, rather than describing the whole industry as one Europe wide cluster. However cluster definitions, of which there are many, will not be discussed here.

To assess the innovative capacities of the aerospace sector, for example with regard to technology transfer, the organisation of the aerospace industry is often described by "tiers"[9]. At the top tier of the pyramid are the largest system integrators, the airframe assemblers (prime contractors). At the second level are manufacturers of propulsion systems, of on-board avionics and manufacturers of airframe structures and subassemblies. Tier 3 companies produce electronic subassemblies, hydraulic systems and fuselage parts. Usually technological knowledge flows from the top down, but some information moves up, mostly from tier 2 to tier 1 firms. The aerospace industry is highly concentrated and continues to consolidate, because companies have seen the need to combine resources in new configurations to meet the challenges of global competition and to respond to orders for trans-national projects.

Aerospace clusters normally consist of one or several prime contractors surrounded by hundreds of small and medium sized manufacturers offering parts and components to tier 2,3 and sometimes tier 1 companies. There are more than a dozen identifiable regional aerospace clusters in the EU, for example in France: Toulouse, Bordeaux, Ile de France, Marignane, Istres and Bourges. In the United Kingdom:

[8] Wijnolst/Jenssen/Sødal "European Maritime Clusters", page 85/86

[9] Industry and Innovation, Vol. 12, No. 1, 1-25 March 2005 "Aerospace Cluster: Local or Global Knowlecdge Spillovers?", 9. 8

Lancashire, Bristol and around Farnborough. In Germany: Hamburg, Bavaria, Brandenburg and Bremen. In Italy: Piemonte, Lombardia and Campagnia, in Spain, around Madrid and Bilbao, and in Sweden around Linköping and around Göteborg.

1.3 Maritime industries: LeaderSHIP 2015 and Waterborne TP as building blocks for a European maritime cluster policy

Despite the diversity of activity and business interests, it is the common know-how and scope for synergies which have linked the different actors together in a successful European "maritime cluster". The waterborne sector already manifested this cluster-approach more visibly in the early 1990s by creating the Maritime Industry Forum (MIF), which also defined a first research agenda in form of the Maritime Industry R&D Master Plan.

In a number of maritime industries, most of the value-added is produced by subcontractors, and their input, innovative power and reliability are vital to the main manufacturers. Clusters are particularly important for the interaction between maritime manufacturing and a wide range of services (which themselves may have particular relations to other ancillary services such as insurance or brokerage), as well as for the relations between social partners. Clusters can offer subcontractors access to information and knowledge that they cannot afford to acquire based on their own limited resources.

Through their participation in clusters, sub-contractors can also develop expertise that opens new markets, even outside their own cluster. This can lead to new markets in sectors where the main activities are being relocated. Through joint training and education strategies, clusters can be instrumental in ensuring the skills base and improving the attractiveness of the profession by facilitating career switches between sea and land-based professions. In this respect, it is noteworthy that for shipbuilding, maritime transport, inland waterways transport, fisheries and the hotel and catering sector, social dialogue committees already exist which allow social partners to develop joint strategies. Social partners of the different sectors of the maritime cluster also work together on a number of issues that are affecting the broader maritime cluster. Synergies and areas of co-operation can be sought, and initiatives developed in a way which ensures transferability, comparability and mobility between related sectors.

Maritime clusters can derive benefit from knowledge sharing and knowledge transfer from research, encouraging joint innovation exercises (e.g. product development), ensuring availability of know-how (e.g. joint training programmes) or innovative organisation methods covering a group of enterprises (e.g. common procurement or distribution).

The regional nature of shipbuilding activities requires special attention. Yards cannot be moved in the same way as other industries. Historically, this has led to regional centres, characterised by a cluster of maritime industrial activities. However, whereas traditionally most subcontractors are located near the yards, economic activities and jobs are also generated in regions further away.

Best practice can be spread by connecting the existing maritime clusters in Europe, as demonstrated during the 2005 Maritime Industries Forum (MIF) in Bremen[10], making them regional centres of maritime excellence (covering the full range of the maritime industries including services), as well as by connecting them to relevant actors in regions distant from the coast.

Useful elements from the national cluster approaches developed so far are, for example, detailed SWOT (strengths, weaknesses, opportunities, threats) analyses (also in comparison to maritime centres outside the EU), specific forums on innovation, employment and export competitiveness, and awareness campaigns including branding, participation in trade fairs and the production of merchandise.

- LeaderSHIP 2015

European shipyards acknowledge that the challenges in the world market can no longer be solved without a coordinated approach at European level. A High Level Advisory Group on European level was established in early 2003 and presented its report "LeaderSHIP 2015", which later resulted in a Commission Communication[11].

Work has been progressing steadily in the eight thematic areas covered by LeaderSHIP 2015 which are:

- Trade
- Innovation and R&D
- Financing (of shipyards)
- Transport and environment
- Naval shipbuilding
- Intellectual Property Rights
- Employment, skills and training and
- Industry structure.

It is foreseen that the Commission will issue a LeaderSHIP 2015 progress report in 2007.

- WATERBORNE[12]

The Technology Platform WATERBORNE was established during the MIF 2005. It is a forum for all stakeholders to agree on a medium to long term vision, assess the key challenges for the maritime industry and waterborne transport and operations, formulate the R&D actions to be fulfilled for meeting these challenges in a Strategic Research Agenda (SRA), and promote the mobilisation of the necessary resources.

10 http://www.mif-eu.org/ (see in particular the Bremen 2005 Plenary)
11 COM (2003) 717 final of 21.11.2003
12 http://www.waterborne-tp.org/

Similar to the ACARE Technology Platform for aeronautics, WATERBORNE developed a "Vision 2020" and a Strategic Research Agenda (SRA). Vision 2020 describes the main challenges of WATERBORNE's medium and long term vision. The SRA translates into concrete R&D milestones the necessary steps to achieve this vision.

1.4 What are the cluster enablers of European Enterprise policy?

Cluster policy is not an isolated, independent, well-defined discipline, but requires contributions from many policy areas to be successful. Regional policy, education, research and innovation, financial policy, fiscal policy, national, regional and local incentives, SME policy and industrial policy initiatives can all play important roles. European Commission activities sometimes support directly and sometimes indirectly, the creation of networks, for example through research and development programmes or the exchange of information and good practices through Euro Info Centres and Innovation Relay Centres.

Although, the EU has many dynamic industrial clusters, they tend to be smaller and less integrated than in the US. Research and innovation therefore suffer from fragmentation in the same way as the internal market[13]. Clusters can especially help small and medium sized enterprises and research institutes to get access to European research projects, either as subcontractors for one of the project leaders or by bundling their capacities and resources. In order to ensure co-operation with other European partners, it is important for regional clusters to establish contacts with other regional clusters. Networking within clusters and across complementary clusters is an important factor for their successful development. Training and research centres, financial institutions, innovation and intellectual property consultants, local and regional development agencies and other support organisations are all key players in maximising firms' creative business potential.

European structural funds may support regional and trans-regional clusters, poles of excellence, technology transfer, business support services and actions to develop human capital and to help workers and enterprises anticipate and adapt to economic change. Regions and Member States can use the Structural Funds in a flexible manner to help meet their specific needs and exploit the synergies with the 7th Framework Programme for Research (FP7) and the Competitiveness and Innovation Programme (CIP)[14].

Several EU measures encourage and support the efforts of Member States and regions. The Commission can provide them with a map analysing the strengths and strategies of existing clusters in the EU. The Europe-INNOVA initiative can provide support to facilitate networking between industrial clusters with a view to intensifying trans-national cooperation and learning how others build and manage successful cluster initiatives. Current initiatives of the European Commission cover the following aspects:

[13] COM(2005) 488 final of 12.10.2005
[14] COM(2005) 488 final of 12.10.2005

- Cluster mapping

The Commission launched a first study on clusters in the 10 new Member States of the European Union. It started in 2004 and was completed in June 2006. Its objective is to identify existing clusters in the 10 new Member States. A second study on cluster mapping being carried out covers the further 15 EU Member States, Bulgaria, Romania and Turkey as well as Norway, Iceland, Israel and Switzerland. The objective is to identify regional clusters in the mentioned countries and to establish a European database on cluster policies and of institutions in the Member States and regions responsible for the development of cluster policies. This study will be the basis for a permanent European Observatory of clusters and cluster policies.

- Fostering co-operation between clusters in the EU

The Europe INNOVA initiative[15] is supported by the European Commission under the 6th Framework Programme for Research and Development and aims to inform, assist, mobilise and network the key stakeholders in the field of entrepreneurial innovations such as European citizens, firms' managers, policy makers, cluster managers, investors and relevant associations.

Europe INNOVA adopts a sector-based approach that is strategically designed to identify and analyse the leverages and barriers to innovation within specific sectors (automotive, biotechnology, eco-innovation, ICT, energy, food / drink, space, textile, chemicals, machinery / equipment). It is intended that this approach will lead to sound and targeted innovation policy measures. Furthermore, the sector-based approach will activate cooperation between business clusters in Europe through the establishment of networks between clusters that operate in the same or different domains. Through such cooperation it is envisaged that existing clusters will adopt "outward looking" approaches by establishing learning platforms between them for exchanging experiences, information, good practices and knowledge, and to develop joint research projects and business strategies.

- Fostering co-operation of public authorities for the development of joint cluster programmes

The PRO INNO Europe is an innovation policy initiative launched in 2006. It provides a point for innovation policy analysis, learning and development, and stimulates trans-national co-operation among national and sub-national innovation programmes in Europe. It is expected that a European cluster alliance is created among these partners and a Memorandum is signed by the end of 2007.

- Regions of Knowledge

Launched by the European Commission in August 2003 at the request of the European Parliament, the Regions of Knowledge Pilot Action promoted the active

[15] http://www.europe-innova.org/index.jsp

involvement of local players in designing and shaping regional knowledge development models. The new 7th Framework Programme for Research and Development will continue to fund Regions of Knowledge to support existing regional research-driven clusters (bringing together regional authorities, universities, research centres and enterprises) and the emergence of new ones.

- State aid for innovation

The EU-state aid rules recognise explicitly the importance of clusters for the competitiveness of the European Union. The current revision of the rules will further explore the market failures linked with coordination problems hampering the development of clusters and ways for funding of cluster policy measures. In September 2005 the Commission launched a consultation on improvements to state aid rules as regards projects encouraging innovation[16].

1.5 How can Member States contribute to a EU cluster policy?

EU Member States and regional authorities have already developed their own industrial strategies and many of them include the support of clusters. A number of EU Member States have already adopted a cluster policy within their competitiveness and innovation policy. Some EU Member States have a strong tradition of support for clusters and innovation poles, while others have set ambitious policy objectives using clusters as a key instrument in their National Reform Programmes to contribute to the Lisbon Agenda. Several new Member States have given particular prominence to developing clusters as an important instrument with which to raise their competitiveness.

There is a trend towards a bottom-up approach to cluster development. Europe's national and regional aerospace associations have for example become increasingly important players for the development of clusters as well as local development agencies, because they are usually an important source for funding. Regional authorities and aerospace associations can contribute to the support and animation of the cluster, take measures to promote the cluster and hence attract new companies and other institutions to enlarge the cluster and to create a good mix. More generally it was found that although internationally competitive clusters by definition have linkages with foreign partners, or at least with foreign customers, nevertheless most policy initiatives focus on regional clusters and address the actors within their administrative boundaries[17].

In some cases it seems to be important to create incentives to specialise in certain capabilities and to build centres of excellence. As a second step, incentives could be aimed at supporting existing clusters and helping them to achieve a critical mass rather than trying to create new clusters from scratch. Policy could focus on providing a framework for dialogue and co-operation between SMEs, higher

[16] Consultation document COM(2005) 436 final of 21.9.2005

[17] European Trend Chart on Innovation, Thematic Report Cluster Policies, March 2003, http://ec.europa.eu/enterprise/innovation/consultation/list_studies.htm

education and research institutions, and public and non-public organisations at local, national, European and international level.

There is a wide range of activities that can be done by national and regional authorities, agencies and associations to foster cluster development, for example identifying market failures, providing cluster management and advice, developing links between industry, research institutions and universities, offering and implementing appropriate education and training schemes, creating platforms for networking and exchange of information, and providing specialised infrastructure or financial support.

2. Maritime Cluster policy from a Norwegian Shipping Perspective

Interview with Elizabeth Grieg, CEO Grieg International

Interview by Niko Wijnolst, Oslo, June 1st, 2006

Q: The Grieg Corporate Vision, as stated in your Annual Report[18] is quite remarkable. Shipping is by its very nature a global activity and you employ only Filipino seafarers on your ships. Why is it then that you emphasize to keep your headquarters in Norway?

VISION
"Create lasting value through our common effort"

- Through the development of modern global sea transportation, contribute to a peaceful coexistence between people
- Contribute to the protection of our marine environment and ensure safety at sea
- Maintain our headquarters in Norway in order to preserve and develop our competence
- Influence and shape the future of our maritime industry and support the maritime cluster in Norway

A: Our company is privately owned by our family. We are the fourth generation of the Grieg family that is involved in shipping in Norway. This illustrates that our family's roots are in Norway. Norway is a pleasant country to work and live in. Besides, we share the cultural values of the Norwegian society and we like to contribute to its development. We can afford to take the long term view. On top of that, life is not only about money. We like to raise our children in a society in which our values are being passed on to them.

Q: Shipping is a global and very competitive industry. Your company has chosen to be a leader in the specific market niche of industrial shipping, in particular with open hatch bulk carriers. Can you defend your long term competitive advantage in this niche from a Norwegian base and which policy changes should be implemented to create a level playing field for Norwegian-based shipping companies?

A: We operate not only out of Norway, we have activities in many areas of the world. The shippers that we serve are global clients and our fleet trades on all the oceans. Many services to our shipping services are sourced abroad, whether this is maintenance on the ships, or building new ships in the Far East. We are a globally operating company with a head office operation in Norway. Many Norwegian

[18] The Grieg Shipowning Group, Annual report 2005, see www.grieg.no

shipowners are not happy with the entrepreneurial climate in Norway, in particular the constant changes, and have decided to conduct their business elsewhere. That is obviously not good for the country. In the long term such a development may threaten the entire maritime industry in Norway, as we may lose our critical mass. Shipping is one of the biggest sectors in the Norwegian economy and the government should therefore be prudent with their economic policies. The industry wants a stable and predictable policy that does not change from year to year. Costs become unpredictable and that creates uncertainty and even possibly a brake on long term investment in the Norwegian economy. We have chosen for a dialogue with politicians in order to try to convince them that they should create a level playing field for the Norwegian maritime industry, in particular shipping as it does exist elsewhere in Europe within the EU state-aid guidelines. Unfortunately, so to speak, we have the oil revenues. That creates the luxurious position with the general public and politicians that remaining competitive in the rest of the economy is not such a high priority. At the same time we are realistic. Living in a country with a very high quality of life has a certain price attached to it and we are committed to stay with our headquarters in Norway.

Q: The Grieg Business Idea, as stated in your Annual Report 2005, stresses the cornerstones of the company's competitive advantage, such as market knowledge and innovation. How important is the Norwegian maritime cluster for your company to help you maintain this competitive advantage?

BUSINESS IDEA
"World class industrial shipping"

- Our trade mark within the shipping industry shall be built on quality, safety, integrity, market knowledge, innovation and strength
- We shall proactively develop Star Shipping AS' world leading position within pulp and other unitized cargo markets
- We shall focus on synergies and spin-offs from our shipping know-how, and actively evaluate new business opportunities

A: Yes the Norwegian maritime cluster and its specialised knowledge and expertise is important for our company, but then again, the world has become so integrated and communication so easy that the natural advantage we had is eroding. The world is developing faster and faster and you cannot believe that one country can provide all the answers to your business needs. On top that, the real economic growth today and in the future will not take place in our part of the world, but in Asia and South America. We have to acknowledge that, and we have to make sure that we are present in those growth markets and act upon the opportunities. Our politicians should be more aware of the dynamics in other regions of the world and create the right conditions for the Norwegian industry to remain successful. But our oil revenues create a sentiment that we are protected from all these global changes. My hope is that Norway will join in the future the European Union as that will help

Norway to modernize its economy. Norway already contributes to many EU programmes and many Norwegian maritime companies participate in various research projects or have invested in European companies. The Norwegian industry understands the necessity and sees the opportunity that the European Union offers. Their leaders do not wait until the politicians take a decision to become part of the European Union. They cannot afford to stand on the sideline as Norway's home market is too small. The European Union offers a huge home market, as it is the largest maritime nation in the world.

Q: In 1948 Norway was the 3rd largest flag state in the world. For a long time Norwegian shipowners maintained this position, although not always with their ships registered under the Norwegian flag. In 2004, Norwegian shipowners lost their 3rd place in the world ranking to Germany, and dropped to the 5th place. Will this downward trend continue, in spite of the buoyant shipping markets?

A: Unfortunately this is a trend partly caused by our country's politicians, as many Norwegian shipowners have given up hope over the past decade and have decided to relocate their shipping business to other shipping centres like London and Singapore. What these politicians forget is that not only the high value added from these shipowning activities disappears, but also related activities as well as the power to impact the international maritime agenda within for example IMO. Norway has safety and the environment high on the political agenda and through the international maritime fora it can make propositions to make the world a better place. That position will erode if nothing is done and that is against the Vision as formulated in our Annual Report.

Q: Lloyd's List of 31 May 2006 carries a special report on Norway. The following editorial comment sums up nicely the opinion of many outsiders to the Norwegian shipping politics saga. I quote the opening lines: "Outsiders looking in on the contrary world of Norwegian politics and shipping cannot help but be struck by two simple questions. Why does a country awash with so many petro-Kronas get itself so uptight about a tonnage tax break in place across the rest of Europe? And why does a nation so wedded to the sea seem to loathe its shipping tradition so profoundly?" Can you understand these harsh words?

A. This is indeed the paradox we already spoke about. It is an unfortunate situation, but I am hopeful that we can turn the tide again, as was done in the past.

Q: In the early 1990s, Norway, inspired by the work of Michael Porter on competitive advantage of nations, undertook a unique series of studies under the heading "A Competitive Norway". Shipping was one of the focal points. What has been the impact of these studies on Norwegian economic policy? If the studies would be updated today, what would be the outcome and difference with the 1990s situation?

A. What happened after the studies were completed is that there developed two schools of thought on economic policy, linked to the academic institutions in Oslo and Bergen respectively. The academics have different views on what a sound economic policy is. One school is in favour of a total free market policy with no government interference what so ever, while the other school supports the (maritime) cluster philosophy and allows for - under certain conditions - government measures in order to maximise economic cluster benefits. The debate has been raging for many years now and with each change of government another school has the ear of the politicians and the shipping regime changes accordingly. In fact, shipping has become the battle ground of the Norwegian academics on economic policy, that is what it boils down to. However, I am convinced that in the long term Norwegian politicians will have to accept the fact that our close European neighbours, like Denmark, have implemented the state-aid guidelines in shipping and that Norway should do the same.

Q: In Attracting the Winners *(2003), Jakobsen et al., compare the competitiveness of the Norwegian maritime industries with four European countries. The conclusion of this comparative analysis is rather negative for Norway. Few maritime companies would choose Norway as a location. Do you believe that the future European Maritime Policy could help Norway to turn the tide?*

A: Yes, a European Maritime Policy, as is being outlined in the European Commission's Green Paper, will help Europe to become stronger. This will have an impact on the policy views of the Norwegian politicians, and it may result in a reversal of the current situation. I am optimistic that the Green Paper debate in Europe will also have a positive influence on the Norwegian shipping debate. Norway cannot isolate itself from the rest of Europe.

Q: Europe is a maritime superpower, in terms of market- en technology leadership. Within Europe, Norway is one of the most prominent maritime countries with a strong and specialised maritime cluster. Norway has a lot of knowledge about the structure and economic importance of its maritime cluster. Norway has been in the past a role model for the European maritime industry, as many innovations originated in Norway. This leading position is currently diminishing, while the opportunities for innovative leadership are still around. What should be done in Norway to regain its innovative leadership position?

A: When shipowners leave Norway and take their business to another country than this will weaken the innovation networks. In the beginning this is not felt, as the impact is minimal. However, as more companies follow than it is like a domino effect, where there is no more stopping the downward spiral. That should be avoided at all cost, as innovation has been indeed the prime mover of Norwegian shipping and the maritime cluster.

Q: Shipping may have lost its lustre in Norway, but I can tell you that Europe cannot do without the creativity and innovativeness of the Norwegian maritime industry. So, if Norway does not wish to support its shipping industry as part of its economic

policy, than it should at least do it for Europe. Norway is the European country with the broadest maritime knowledge base among its citizens and they are willing to put heir money into daring new developments. That is an asset for Europe which is valuable and should be treasured. Should Europe get involved in the Norwegian shipping debate?

A: If Europe wishes to remain a maritime power than we have to work to together to survive in this competitive world. It may be a good idea when leading maritime nations highlight the importance of the Norwegian maritime cluster for Europe's maritime future. There are so many common interests which the Norwegian public and politicians are not always aware of. Yes, why not mobilise Europe to contribute to the Norwegian shipping debate!

Q: Your company is concerned by the lack of highly educated people with a basic knowledge of nautical and maritime affairs. The maritime industry has created a trainee programme (25 people) to fill the future need. However, at the same time you employ only Filipino seafarers (>500) on your ships. Why do you only employ Filipino's and not Norwegian officers?

A. Many years ago we decided not to operate our ships with crews from various nationalities. Therefore we chose for Filipinos, officers and ratings, as it is important for the communication and social contacts on board to have a crew with a cultural cohesion. We have a positive experience with well trained Filipinos on our open hatch bulk carriers. We also have Filipinos in our office in Norway and Manila. Young people in Europe prefer not to go to sea and chose for a maritime career. We believe that this is a lasting trend and that we cannot row against the tide. Our management has decided to adapt the culture of the Grieg Shipowning Group to this new reality and make it a multinational and multicultural workplace. Given the future trends in world population where the rising stars of the shipping world are Asia, these countries will also supply the majority of the seafarers in the future. At the same time we and other Norwegian companies try to attract young academics via a trainee programme. It is still a small programme, but it may grow in the future.

Q: In The Netherlands we have carried out detailed labour market surveys indicating a high intersectoral mobility within the maritime cluster. Many young officers after 5-10 years at sea return to shore based jobs in the maritime world, bringing home hand's on experience of maritime operations. Do you believe that Norwegian shipowners, together with the other maritime sectors should take a long term view to attract more young people for a career at sea? And if yes, which conditions should be met to achieve this?

A: I do not know the extent to which labour mobility is high or low in the Norwegian maritime cluster. My impression is that it is not very high; shipping people remain within their sector. Young people have many more options today and look for exciting jobs and they are less concerned in what sector of the economy this is.

Q: You are currently vice president of the Norwegian Shipowners' Association. There is a heated debate in Norway concerning changes in the national shipping policy. What are the policy options and what will be the possible impacts on Norwegian shipowners and the maritime cluster as a whole?

A: I wish shipping to be an industry that is in tune with the views of the Norwegian population, an industry that we can be proud of, an industry in which we can demonstrate that we create a lasting value for the Norwegian economy and which has a good reputation. To achieve that, we have to work in various arenas in order to contribute to a constructive and positive dialogue with all the stakeholders.

Q: Finally, Mrs. Grieg, in our contacts with our maritime colleagues in Norway, we have met with a relatively large number of female professionals holding interesting and high-level positions. In the Netherlands this is unfortunately not the case. So, how have the Norwegians made the maritime world attractive to women, or how have they attracted so many qualified women? What recommendations would you have for European maritime organisations in this respect?

A: Various Norwegian governments have over the past 30 years created the infrastructure and policies to enable women and men to have children, to care for them and to work and have a career at the same time. Leave of absence, childcare and so on have eliminated many of the constraints for women to participate fully in the labour market, also at higher management levels. Many of these radical changes in our labour laws and social infrastructure have been made under former prime minister Gro Harlem Brundtland, during her two terms in office from 1988-1996. Without her commitment to create equal opportunities for women and men, I believe Norway would not have come this far in this development.
The change is now coming to board rooms of companies where women should have equal representation in the future, which is a natural extension of the achievements made in the past decades. By the way, this is a good example of the Norwegian quality of life that I cherish.

Q: Mrs. Elisabeth Grieg, thank you very much for this interview.

3. The German Maritime Cluster

Interview with Mr. Georg Wilhelm Adamowitsch, State Secretary, Coordinating Maritime Affairs. Federal Ministry of Economics and Technology.

Interview by Niko Wijnolst and Henk Janssens[19], Berlin, Germany, June 14th, 2006.

Q: Mr. Adamowitsch, your department coordinates the maritime policies on state, federal and European level, for the total width of the German maritime cluster. Your department organizes the Nationale Maritime Konferenz. What is your experience so far?

A: The National Maritime Conferences have become the most important maritime platform in Germany, where political and economic issues in the maritime cluster are on the agenda. All maritime sectors participate in this meeting.
On the fifth National Maritime Conference - to be held on the 4th of December 2006 - nearly one thousand decision makers will meet, invited by the Chancellor, Mrs. Merkel: representatives from the business community and trade organisations, members of the federal and state parliament and politicians from all levels of government. On the points made and questions asked during the Conference action will be taken and this will be discussed in the follow up to the Conference. Agreements concluded will be reviewed in a same manner.
The Maritime Conferences have started a constructive dialogue between the involved stakeholders, which has lead to increased cooperation in the maritime value chain, more networking and increased synergies. And this in turn reinforces the process of clustering in our maritime economy.

Q: The German shipping sector ranks currently as number 3 in the world in terms of the total fleet controlled in deadweight tonnes, behind Greece and Japan, but before China and Norway. In an expanding world fleet, increasing its rank from 4th place in 2004 to 3rd place in 2005 is a major achievement. Which factors have contributed to this success for Germany, and Europe?

A: The German shipping industry can indeed show a very positive balance sheet.
The merchant fleet under control of German shipowners consists of approximately 2800 ships with more than 52 million GRT.
After the introduction of the tonnage tax the total deadweight of the fleet has doubled and shipowners have reflagged 135 vessels.

Additionally we have seen some very favourable market conditions. Time charter rates - for German shipowners very important - have shown an all time high in the first half of 2005, and are still on attractive levels. Shipowners have used these

[19] Prof.dr.ir. Niko Wijnolst is chairman, and drs.ir. Henk Janssens is managing director of the Dutch Maritime Network .

positive developments to further increase and modernize their fleets. Approximately half of the vessels of the German merchant fleet is less than four years old.

Moreover this has had also its effect on the labourmarket situation. Shipowning companies train more students than before; and both on sea and on land they have created more jobs than in the last thirty years.

Q: How important is the German maritime cluster for the German economy in terms of contribution to the GDP, exports, employment, investments?

A: It is not easy to answer this question in facts and figures. The strong interrelation e.g. in the shipbuilding industry - less than 30 per cent of the added value is created by the yards, more than 70% originates from the strong German maritime equipment suppliers - can lead to incorrect conclusions. The same holds true for shipping, ports and the service industry who work together closely and for which it is difficult to draw exact boundaries.

Recent figures show a turnover in the German shipbuilding industry of 6.1 billion Euros in 2005 and an export share of some 50%; for the equipment suppliers a turnover of 8.3 billion Euros of which 66% is exported. In these two sectors there is jointly an employment level of some 100.000 persons.
The German shipping industry has been doing well in 2005 with a turnover of approximately 15 billion Euro.
Unfortunately for the port sector only throughput figures in tons are available, which makes comparison difficult. The shipping and port industries also employ some 100.000 persons.

In any way the German Federal Government regards the value chain of the maritime economy – in the manufacturing industry from equipment supplier through the completion of a ship as well as in the cooperation of logistical providers (shipping, road and rail transport and inland shipping) – as very important for the competitive position of German industry. .

Q: What is your role within the Ministry of Economics with regard to the development of maritime cluster policies in Germany?

A: The Ministry of Economics has been designated to coordinate the maritime policies of the federal government. Basically it is to fulfil a role as a moderator, who supports and expedites the matching of political positions in the respective departments. It should be noted that the competencies of the various ministries are left untouched by the coordinator. However as coordinator the Ministry has the right to table ideas in every or any maritime subject. As such I am often approached by various maritime organisations to table subjects of specific concern.

In coordinating the maritime economy I consider it in particular as my task to pursue political consistency in the development of an operational total framework for the maritime economy.

I try to achieve this through an intensive dialog between all relevant players, whether they are federal, state level or from the business community.

Q: The German government has adopted the tonnage tax system and related fiscal policies for seafarers. Have the targets - as agreed on the National Maritime Conference - been achieved?

A: I am very positive on the effects of measures taken to improve the reinforcement of the competitive position of Germany, and to change the outflagging trends that we have experienced for some years.
The German shipping sector is now clearly in an upswing, all indicators are positive. The successful "Maritime Bündnis" (agreements between Government, shipowners and trade unions, made on the National Maritime Conferences, ed.) and the tonnage tax clearly have had a major contribution in this. But also the promise of the Government to lower labour cost components and to maintain the tonnage tax, has improved Germany's competitive position.

The agreed targets as set during the National Maritime Conference in Lübeck in the frame work of the "Maritime Bündnis" have been realised in time and before schedule. This also holds true for the level of reflagging as promised by the shipowners. A minimum of 400 vessels under German flag in international trades was aimed at . Of the total of 2800 merchant ships of German shipowners - as the recent statistics of March 31, 2006 show - 594 vessels with 11.4 million GRT are sailing under the German flag.
Of course the share of foreign flag tonnage (81,5%) is still high, but clearly lower than the figure of 2005 (85,4%). This makes Germany one of the few maritime nations where the share of foreign flag tonnage is decreasing .

It is important to continue the successful "Bündnis" cooperation on a consistent and lasting basis in favour of maritime Germany.

Q: German ship financiers play an important role in channelling investments into the shipping sector. Does your Ministry or the Ministry of Finance stimulate these investments? And how much does the German shipbuilding industry benefit from this?

A: Like in the other member states of the European Union shipowners and investors in Germany can declare their profits under the tonnage tax system.
No other incentives have been put in place by the Ministry of Economics or the Ministry of Finance.
The German shipyards hardly benefit from the tonnage tax. Most German orders for newbuildings are placed with shipyards in the Far East.

Q: The German shipbuilding industry receives under the EU state aid guidelines a subsidy of 20 percent on the investment in Research, Development and Innovation. How much is this RD&I subsidy per annum, and what other innovation subsidies are available and paid to the German maritime sectors.

A: The 20% subsidy is to promote the industrial application of innovations in shipbuilding, all within the framework of the European Commission for support of the shipbuilding industry.
The German support program, as approved by the European Commission, has a budget of nearly 60 million Euros for the period 2006 - 2009, or approximately 15 million Euros per year.

Additionally Germany has a research and development programme for which annually some 23 million Euros is available. This fits within a EU framework for national research and development support. The R&D programme is general of nature, and shipbuilding benefits only to a minor extent of it. The program also supports developments in ports, shipping and maritime technology.

Q: Over the last few years shipbuilding has been booming. How do you look at the future?

A. It is all about the innovation in shipbuilding. It does not make sense to try to compete in markets where others are simply more cost effective. We cannot compete with Japan, Korea and China in the segment of large tankers, bulkers, etc. Our strategy should be on excellence and innovativity of our products, leading in quality. At the moment we are a world player in mega yachts, Meyer Werft is leading in cruiseships, and the yards on the Baltic Sea are strong in midsized containerships. We have a strong position in naval craft, and the fact that the yards involved in building naval ships also build civil vessels makes them less vulnerable for market fluctuations. With our innovative products we should be a player on world markets. This is even more true for our marine equipment suppliers, who even have a stronger international position. We discuss with them ways and means to stimulate innovation.

We must move away from subsidizing the industry. We can only win in areas where we are strong. So there should be more emphasis on innovation and education.

The Ministry of Economics is also the Ministry of Technology. In our drive for excellence and innovativity we try to bundle available competences, which gives us nationally and in Europe a certain strength. We have good discussions directly with the maritime companies involved.

An area where we definitely have opportunities is the field of security. 85% of German exports leave the country by sea, for which the question of security is becoming essential. There will be more requirements to secure sea transport and here we have some strong cards. We have in Europe e.g. a premier position in satellites, and with Galileo we take a leading position. The new submarine generation and the new frigates - presently on the drawing board - they all add to competences to secure our seaways electronically and intelligently. This also calls for more innovation, new products, very challenging indeed!

Q: Germany is one of the largest exporters in the world (in Euro). Maritime exports are also an important contributor to this success. The Ministry of Economic Affairs is

very active in developing and promoting German industry interests abroad. What kind of export-related programmes are available for the German maritime sectors?

A: The export of maritime products is equally supported as the export of products of other sectors. Primarily it deals with guarantees for export credits. Additionally participation in selected exhibitions and tradeshows, as well as information facilities and matchmaking events are encouraged. The federal government also supports maritime companies through politically flanking of international trade.

Q: You are the organizer of the National Maritime Conference, which is a unique event. The fifth meeting is scheduled for early December this year. What will be the major issues on the agenda and will Chancellor Merkel play a similar role in the event as her predecessor?

A: The fifth National Maritime Conference that will take place in Hamburg on December 4th is the most prominent maritime occasion in Germany this year, and will have as slogan "Maritime Wirtschaft - *Meer* Chancen für Innovation und Arbeit", (Maritime Economy - *More/sea* opportunities for Innovation and Employment, ed.)

The conference will focus on themes such as research and development, innovation, education, qualifications and competency management, as key areas for the maritime future.

Chancellor, Mrs. Merkel, and other high ranking representatives from the political and business communities will take part.

At the start of the meeting the Chancellor will make a keynote speech addressing the targets and focus points for the subsequent workshops, and at the same time she will indicate the direction of additional successful development for the maritime economy as a growth and employment generator.

In five workshops some 1000 conference delegates will discuss

- Research, Development and Innovation strategies for shipbuilding and maritime technology;
- Moderns concepts for shipping, ports and logistics;
- Educational matters with relation to engineers and nautical professionals;
- Continuation and further development for the "Maritime Bündnis";
- Exploitation of sea resources;
- The opportunities and challenges for shipbuilding, maritime technology, port infrastructure and shipping security posed by development of offshore energy.

Q: As we understand shipbuilders have asked the German government to set up a maritime alliance of shipyards, marine equipment suppliers and labour unions, to create a maritime labour pool. The idea would be to create flexibility to switch personnel between shipyards. What is your reaction to this proposal?

The Ministry of Economics supports this idea on which employers and the Metal Workers Union closely and constructively work together. The so-called "Labourpool" is supposed to reduce cost levels for companies in the shipbuilding industry while it would maintain and improve the qualifications of employees . The concept is still in its initial phase, and no results can be reported so far.

Q: The Ministry of Transport is in the process of updating the German Maritime Cluster study. Is your ministry involved in this project, and when can we expect the results?

A: The terms of reference for such study that will be carried out under the auspices of the Ministry of Transport has also been agreed with the Ministry of Economics.

The purpose of the study is to obtain an actual and clusterwide overview over the achievements of the maritime economy and the importance of the maritime cluster for the economy in general. Notably it will focus on qualitative and - for me very important - quantitative valuation of the interrelations between maritime sectors on the one hand, and between the maritime cluster and the rest of the German economy on the other hand. The study shall demonstrate on a scientific basis the importance of the martitime cluster for the German economy.

The study will be commissioned shortly and is scheduled to take 15 to 18 months, so by end 2007 we should have the results.

Q: Maritime cluster organisations in 10 European countries have created a discussion platform for the exchange of best practices, called European Network of Maritime Clusters. These maritime cluster organisations have been set up by the maritime business communities, often with the support of national and/ or regional authorities. In Germany the cluster seems to be organized by the government. This is an interesting concept. What do you consider the advantages or disadvantages of a government led cluster vis-à-vis an industry led approach.

A: Clustering remains primarily the responsibility of the companies involved. They know best what development benefits and cooperation possibilities can be realized. The political authorities can and should stimulate this process, for instance by organizing National Maritime Conferences. The above-mentioned “Maritime Bündnis”, for example, could not have been brought about without the participation of the government.

The German approach in which the maritime coordination - whilst maintaining the sectoral competencies - is carried out by the government, has in my view and with an experience of five years, proven to be highly successful. Whether this model could also be applied in other European countries I will not comment on, this is the responsibility of respective states. But basically I would consider it difficult to leave coordination of a maritime cluster with so many sectors in the hands of private enterprise alone.

From our point of view the direction chosen has been the right one. The federal government in its political consideration has opted for targets - like better use of the network potential, improvement of cooperation and clustering, increase of innovation possibilities, retaining know-how and core competences - these themes all have been successfully tackled.

This approach should be continued in a consequent way, if I consider only the dovetailing of RD&I and know-how transfer between maritime research and the business community. These themes will be in the center of attention during the forthcoming National Maritime Conference.

Essential for a successful maritime policy is a continuing dialog between federal government, states, trade organizations, entrepreneurs, unions and scientific research institutes.

Q: Representatives of your Ministry participate in the meetings of the European Network of Maritime Clusters. Do you see an extended role for the European Maritime Cluster organisations in the strengthening of the economic policies?

The strength and future perspectives of the maritime economy cannot suitably be approached by the isolated considerations of individual branches.
Through a cluster approach it can be better demonstrated that the branches have opportunities for a healthy future and can create permanent jobs.

The cluster approach is an essential precondition to create an integrated European Maritime Policy, as the European Commission in their recently published Green Paper has proposed. As such there will be an important role for the European Maritime Cluster in the European Maritime Policy.

It is about developing an integrated Maritime Policy that will unlock growth and employment potential, in an environmental sustainable way.

I fully agree with Commissioner Borg that with the development and diversification of the maritime economy the necessity arises for coordination and planning, to avoid conflicts and to optimize societal benefits.

Q: The European Union has a number of programmes that intend to promote short sea shipping, such as Marco Polo and Motorways of the Sea. Is the German government supporting these programmes?

A: The federal government supports these European programs of course. In the framework of the European growth initiative (November 2003), we have submitted 19 German projects to the Commission.
An important project aims at reinforcement of the Trans European Network (TEN), through improved port access and hinterland connections by rail, inland shipping, and short sea shipping.

"Marco Polo II" and the related concept "Motorways of the Sea" will continue to focus on a better modal shift away from road freight transportation. This is of great economic importance in the completion of the European internal market. Support measures should however not lead to distortion of competition .

Up to now no Motorways of the Sea projects in Germany have been supported out of TEN funds. Federal and state governments and the business community are in close contact to define mutual projects that will fit the concept framework and that can be supported financially from EU budgets

The activities in the European support framework are supplemented by the know-how of the German Short Sea Shipping Promotion Centre (SPC), which is active in the reductions of obstacles that hinder freight transport over water. The SPC is very successful and has initiated a number of modal split changes, resulting in a reduction of 114 million ton kilometer roadtransport (9.000 trips of a 40 ton lorry from the Ruhr area to German seaports).
The federal government will continue to support SPC through 2007 on the basis of a Public Private Partnership (50% federal, 25% state level, 25% private).

Q: The European Commission published recently the Green Paper on a European Maritime Policy. Do you have an initial reaction to its policy proposals?

A: The integrated approach of the EU Green Paper is the right approach to face the challenges of the respective maritime sectors in a joint manner. A stronger network of the individual maritime branches is since years the cornerstone of the national maritime policy of the federal government.

The Ministry of Economics focuses its contribution to the Green Paper - for which the Ministry of Transport acts as coordinator on behalf of the German Government - to follow a balanced approach and clear priorities that are in line with the Lisbon strategy of the European Union.

For Germany a joint maritime policy is important and we will make the Green Paper a topic for the next German presidency of the European Union. We need a European policy that coordinates, using the strength of regions and sectors. However this should not result in bureaucracy.

Q: Europe is the maritime superpower in the world, as it owns 40 percent of the fleet, orders 40 percent of the new buildings, has a turnover in shipbuilding that exceeds that of Korea, Japan and China, handles 25 percent of world trade through its ports, is the number one in yacht building, dredging, inland shipping, offshore services and has leading research classification societies and research institutes, as well as navies. Do you believe that a European maritime policy is relevant to maintain these leading positions, and what (economic) policies should be reinforced to achieve this? And how can we use our maritime superpower position to create greater influence in various international maritime institutional bodies?

A: I believe that Europe is in the position, takes the necessary measures and creates the conditions - the activities with respect to the Green Paper should be seen in this context - to ensure its leading position in the international maritime economy.
E.g. it is important that the EU Commission opts for an active industrial policy. The goal should be to restore - in an ever increasing competitive world - fair trade conditions and create a level playing field.

There is no substitute to the Lisbon Strategy, a mutual effort of member states aiming to develop Europe into the most dynamic and competitive region in the world by 2010. Therefore it needs more national and sectoral support.

The European Shipbuilding Industry has made a good contribution with their LeaderSHIP 2015 initiative, that points into the right direction.
Technology leadership in certain market niches, research, intellectual property protection for innovation and know-how, structural improvements, and knowledge based production and a stronger customer focus should make the European shipbuilding industry the world market leader by 2015. One could say that LeaderSHIP 2015 is the Lisbon strategy of the European shipbuilding industry.

Of course this also requires national support. The German shipbuilding industry is on the right track with its action program "LeaderSHIP Deutschland".

A strong representation of the European Union in international maritime organisations is important and that must be a target. That also means that in the longer term the European Union is to represent the member states, e.g. in IMO. We will not succeed on the basis of individual interests. Negotiations on the basis of European agreed positions can realize our objectives faster and better.

Q: High quality and large numbers of maritime and nautical students are a condition for the German maritime industry to maintain its knowledge based competitive edge over its competition. What kinds of measures are taken to secure the sourcing of young people to the maritime industry?

A: You are correct: Education, training and qualification are the keys for the future of the maritime cluster. This theme will therefore also have major focus during the fifth National Maritime Conference:

- Improvement of the educational situation in the chain between dual educations through higher vocational levels;
- Maintaining and increasing the educational capacities on higher vocational institutions and universities, notably for shipbuilding technology, in a coordinated action between the states;
- Evaluation of the Bachelor - Masters study concept;
- Life-Long-Learning and the development of employee competences.

But it is also about improvements in nautical and mariner's education, in which also the countries along the coast, and the shipowners should be involved.

You should know that it is not the federal government, but the state governments that run the educational system. We try to convince them to cooperate better.

The present situation with respect to shipbuilding makes it clear that quick and concentrated action by the federal government, the relevant states - who have the respective responsibilities - and the business community is required in order for shipbuilders and equipment suppliers to maintain the technology lead and leading position in international shipbuilding.

The demand is for 120 to 125 graduated engineers per annum. At the higher vocational institutions some 70 students are expected to get their degree. In order to meet demand better, the educational capacities of the Technische Hochschule in Hamburg-Harburg - the only institution with a university degree in shipbuilding - are being increased. Nine larger German yards offer a specialized professional education (dual study concept) for craftsmanship and engineering.

The federal government supports the "Education Network for Shipbuilding and Maritime Technology - mar.ing" over a period of three years up to March 2008 with a total of 3 million Euro.
This network aims at a bundling of sector specific competences, using modern information and communication technologies and practical E learning. This program has been well received.

With respect to the sea farers' education some important steps have been achieved in the framework of the "Maritime Bündnis". The number of educational arrangements has been doubled since 2003 and the number of shipowners offering educational facilities has grown to more than 100 companies.

In spite of the positive developments there still is work to do, reason why this issue remains on the agenda.

Q: Could you summarize why economic clusters matters and in particular why the German maritime cluster is an important asset of the economy?

Already in the directions of the federal government to advance the maritime economy it is aptly stated: The maritime economy is through its narrow relationship with the rest of the economy of central importance for an export nation as Germany and has great future potential.

The challenge is to recognize the opportunities and to realize them vigorously. The federal government in the framework of its maritime policy sets out to do just that.

Q: Thank you Mr. Adamowitsch for this interview.

4. The Norwegian Maritime Cluster

by Erik W. Jakobsen[20]

4.1 Introduction

The Norwegian coastline stretches more than 85.000 km, a distance more than two times around the world. Inland, the country is rocky and cut by deep fjords, making communication difficult. In ancient times, going places meant travelling by boat. Also, the rich fisheries drew settlers to the coastal areas. The harsh environment and dependency of the sea made Norwegians good sailors. From the 9th century Norwegians made voyages to as distant places as America and Istanbul.

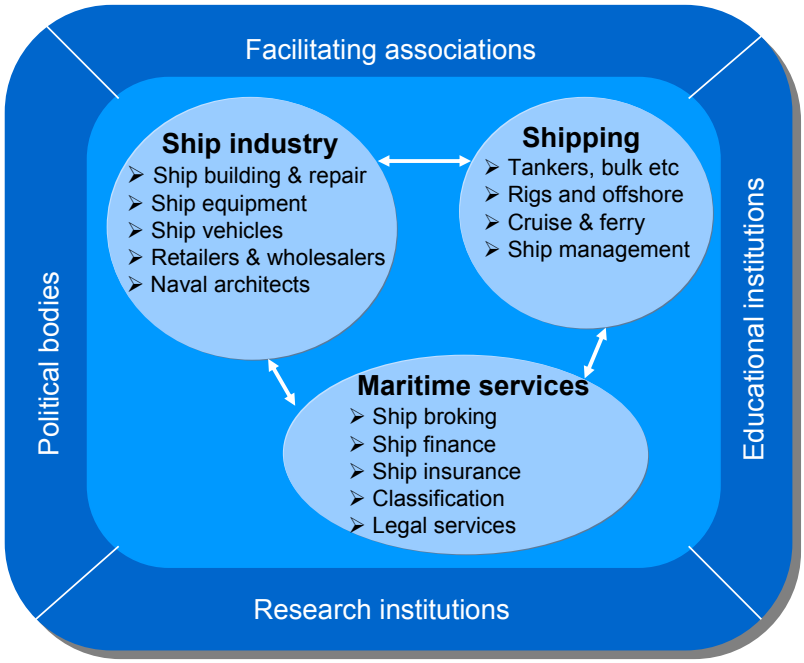
The sea has always been a foundation for economic activity in Norway. Exports of natural resources, for example fish or wood, have been central to the Norwegian economy for centuries, creating a demand for ships to carry traded goods. This demand led to the building of one of the world's largest fleets and a thriving national maritime industry. Its origin stems from the fact that the sea was an everyday part of life and demanded skills and technology development. Today, there are other ways of travelling than by sea and the industry that grew from the sea is now internationally oriented and less dependent on its origins. Still, however, the maritime industry is one of the largest in Norway. Norwegian shipping companies are among the world leaders in their market segments. Yards and equipment makers are competing on international markets. Service providers from financial to engineering services have established and developed alongside the industry. Common to them all is that competence is the core of their activities. An example is DNV, founded in 1864 and now a world leader in classification and one of the leading competence-based export companies in Norway.

4.2 The structure of the Norwegian maritime cluster

The maritime industry in Norway constitutes a complete cluster, composed of three main groups; shipping, maritime services and ship industry. The cluster is illustrated in Figure 1, with the three main groups surrounded by facilitating associations, educational & research institutions and political bodies.

[20] Menon AS, Oslo

Figure 1: Structure Norwegian Maritiem Cluster



Source: Based on G. Benito, et al, 2000 (a report from BI Norwegian School of Management)

Shipping

The shipping segment is constituted by owners and operators of all kinds of vessels, like oil tankers, bulk carriers, container ships, gas carriers, cruise ships and ferries. Drilling rigs and offshore vessels are also included in this segment. Norway is the location of several companies that are among the top three in their markets. Wallenius Wilhelmsen is the world's largest transporter of cars, Teekay Navion Shuttle Tankers is the leading operator of shuttle tankers, SeaDrill is one of the largest rig drilling company, and Farstad is the leading offshore supply company.
Shipping is the core of the maritime cluster in Norway. This is not just because shipping is the largest group, but also because shipping companies are the most international and are instrumental in the internationalization of the rest of the cluster, and because they are large and demanding customers for their goods and service suppliers, hence stimulating continuous innovation in the entire cluster.

Maritime services

A wide variety of more or less specialised providers of services have developed alongside the sea transportation business. Shipping companies are frequent users of service providers in all parts of their value chain, and also yards, ports and equipment makers use specialised providers of services.
Shipping is a capital intensive industry with a cyclical nature and high financial risk involved. Hence, ship financing becomes a vital and knowledge intensive activity. Norway is one of the largest ship financers of the world. DnB NOR and Nordea are among the leading ship financers of the world, and both have increased their market shares in recent years.

Nordea's shipping division is the largest arranger of syndicated loans to the shipping, offshore and oil services industries globally. From offices in Ålesund, Bergen, Oslo, Copenhagen, Gothenburg, Helsinki, London, New York and Singapore, they provide a diversified range of banking services to their worldwide group of clients. Nordea's shipping portfolio is diversified into practically all market segments, like bulkers, gas tankers, cruise ships, ferries, rigs and offshore service ships. At the end of 2003 the bank had total commitments of $9.5 billion making them the 4th largest lender to the industry. Since July 2003 a global syndication unit is established "in house" in Oslo

P&I clubs of global reputation

The market for ship insurance is relatively concentrated with a few players operating on a global scale. One of the leading insurance companies (P&I clubs) of the world, Skuld, is operating globally from its headquarter in Oslo. In addition to its head office in Oslo, Skuld has offices in Copenhagen, Bergen, Piraeus and Hong Kong. As a mutual association, the club is owned and controlled directly by its members. Established in 1897 in Oslo, some 40% of the tonnage entered continues to be Scandinavian-controlled, reflecting the club's traditional balance between Scandinavian and non-Scandinavian business. Other big markets are Western European countries, Russia, Singapore, China including Hong Kong and the United States. Greece and Asia are perceived as key growth areas.
Marine insurance in Scandinavia is based on both strong maritime and insurance competence and know-how. "The maritime cluster in Norway is a fundamental and stable basis for maintaining and developing insurance products and services that are demanded by both national and international clients", says Tore Forsmo, managing director of Cefor (Central Union of Underwriters), Oslo.

World class ship brokers

Shipbrokers are the intermediaries in four markets – freight, sale and purchase, newbuilding and demolition – linking sellers and buyers of ships, and ship owners to charterers and yards. The broker's task is to have a full overview of which cargoes or ships are available, value them, and keep up with market trends.
Norway hosts a large number of shipbrokers. In Oslo alone, there are approximately 180 companies registered, but a vast majority of these are small firms. The two largest Norwegian based players are Fearnleys and R.S Platou. Fearnleys, a fully integrated globally oriented company, is the second largest shipbroker in the world after Clarksons. The company is represented with offices in both Asia and South-America. Their customer portfolio embraces both large Norwegian and international shipowners. The company is divided in several areas of activities, offering a wide spectrum of services. Chartering is the traditional broker's role and is a central part of the company. The area is divided along the main trade areas; gas, tank and bulk. Fearnley also advises on acquisitions and sale of new and second-hand ships through the unit Fearnsale. In addition, Fearnley operates a consulting firm and a research department. Having sales and acquisitions competence, financial competence, chartering and research in-house, Fearnleys is a fully integrated service provider of brokerage services.

Legal services

Legal services in the maritime sector are routinely required for contentious and non-contentious work relating to a wide range of matters including charterparties, shipbuilding, finance, commodities, energy, insurance, cargo, collision, salvage, general average and pollution. To fulfil these purposes requires specialized legal competence. Hence, the presence of the Department of Maritime Law at The University of Oslo, one of the leading academic milieus in the world within maritime legal issues, is an important strength of the cluster. Other vital actors are Wikborg-Rein and Nordic Defence Club.

DNV – 17 percent share of the world ship classification market

DNV (Det Norske veritas) is one of the oldest and most important actors in Oslo's maritime cluster. The company is one of the four large ship classification companies of the world, and its' market share has grown significantly in recent years. Ship Classification is a system for safeguarding life, property and the environment at sea. It entails verification against a set of requirements during design, construction and operation of ships and offshore units.
DNV also offers several other services for managing risk; certification, consulting, software solutions and asset operations. The company is extremely knowledge and R&D intensive and is one of the cornerstones of the maritime cluster, both in terms of competence and size.

Ship industry

Norway has long traditions in ship building, and still there is substantial ship building activity along the Norwegian coast line. The yards have, however, become fewer and more specialized. The largest number of ship building yards are organized in the Aker Yards company, while rigs and other offshore constructions are covered by another Aker company, Aker Kværner. Other important yards are Ulstein, Kleven Maritime, Grenland Group and Fjellstrand located in different parts of the country.
Equipment assembled in new building ships are normally designed and produced by specialized suppliers. In Norway we find equipment producers in a variety of areas; like vehicles, propulsion, pumping systems, navigation systems, paint, heating systems, furniture and positioning systems. Rolls Royce Marine, with more than 2000 employees in Norway, is the largest maritime equipment producer in Norway. Frank Mohn and Kongsberg Maritime are other prominent actors, all of them having a global focus and substantial international market shares.

4.3 The economic importance of the maritime industry in Norway

The importance of an industry may be assessed in several ways, like employment, profitability, productivity and knowledge externalities. There are several characteristics of the maritime industry making it one of most important in Norway: It is large, it is geographically dispersed, and it is advanced and internationally competitive.
To draw the boundaries around an industry and measure its' size is not an exact science. Official statistical nomenclatures seldom fit with industrial realities.

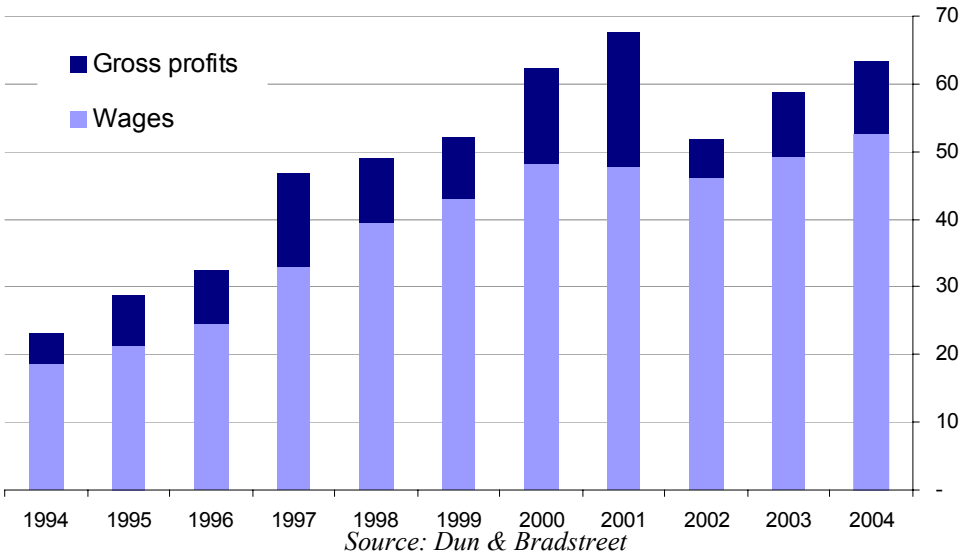
Through a number of research projects the population of the maritime industry of Norway is built bottom-up by key informants in nine different regions (Jakobsen and Goldeng, 2005). Through this method the boundaries of the industry reflects the variation in structure and dynamics of each region. While Rogaland Sør (with Stavanger as the core) is highly offshore dominated, BTV (the south-east region) is more ICT oriented, and Oslo covers most of the maritime services providers.

Value creation

The value creation of an industry measures the industry's contribution to the GDP of its host country. Value creation is the sum of value added in the entire population of the industry. It covers the payment to all the stakeholders of the companies; wages to the personnel, interests to the creditors, tax to the government and residual profits to the owners.

Value creation of the maritime industry amounted to 63 billion NOK[21] in 2004, a modest increase of 8 percent from the year before. Figure 2 reveals the development of value creation from 1994 to 2004, with wages (including income and employment taxes) in the light bars and gross profits (including interests and profitability tax) in the dark bars. Value creation showed a steady growth from 1994 to 2001, with a severe setback in 2002. This year international markets were bad and the macroeconomic conditions in Norway went in the wrong direction, strong currency, high interest rates and unrestrained wage increases. In 2003 the tides changed, but we have to wait until the numbers for 2005 are completed to beat the peak from 2001. Furthermore, the growth may not be as strong as the boom in international markets indicate, because a substantial share of the growth in shipping and rig companies has taken place outside Norway. This is due to the unfavourable political conditions and uncertainty about the possibility for improving these conditions (see Bakka, 2006).

Figure 2 - Value creation in the maritime industry of Norway. 1994-2004 in Billion NOK.

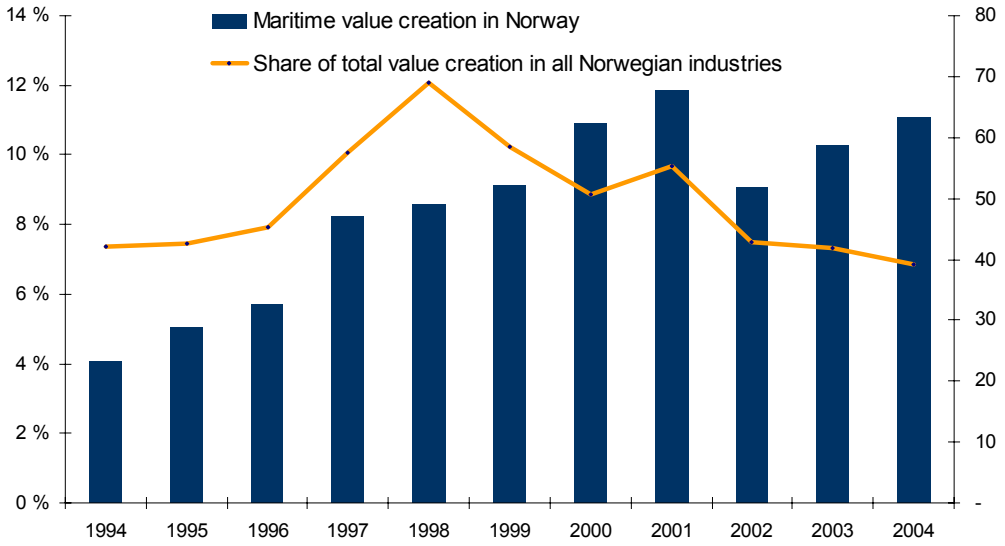


Source: Dun & Bradstreet

[21] The Conversion rate of the Norske Krone to the Euro is NOK = € 0,125

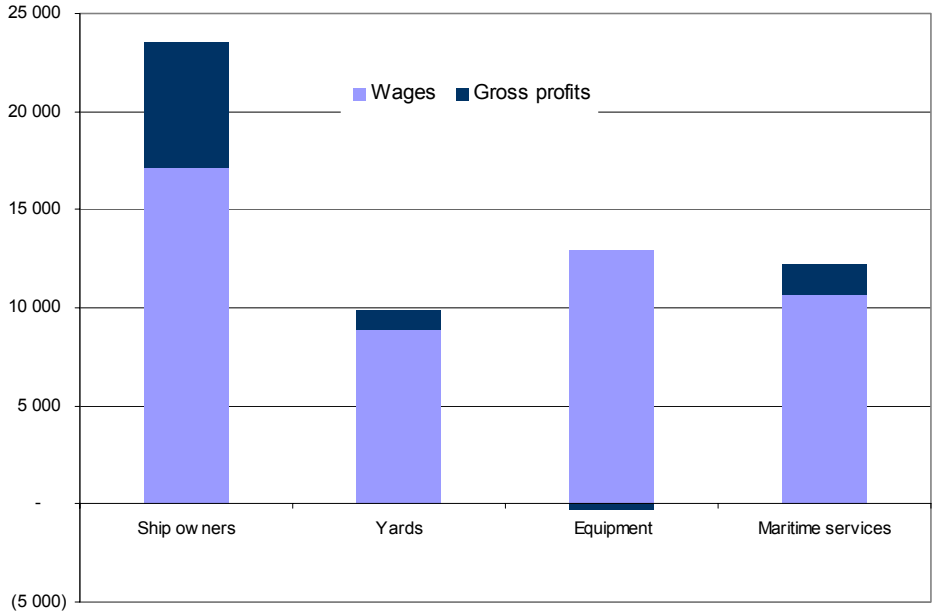
Albeit substantial growth in value creation, the maritime industry has not kept up with growth in Norwegian industries in general, something that is illustrated in Figure 3. Actually, the maritime share of total value creation in the Norwegian business sector, reached a peak in 1998 with 12 percent. In 2004 the share had fallen to 7 percent. This is due to three factors; strong growth in oil and gas prices and in other export commodities, high domestic demand for services, and finally lack of attractiveness for Norway as a host for maritime activities.

Figure 3 Maritime industry's share of value creation in the business sector of Norway compared with value creation growth in absolute numbers. 1994-2004



Shipowners constitute the largest group of companies in the maritime industry in Norway, with 45 percent of maritime value creation, which can be observed from Figure 4. In the last 10 years, shipowners' share has increased from 30 percent, primarily at the expense of ship building yards. Their share has dropped from 22 to 16 percent. Equipment producers, however, have been able to keep their share, while maritime service providers have suffered a modest loss.
Shipowners are the most capital intensive part of the industry, with gross profits constituting one third of their value creation.

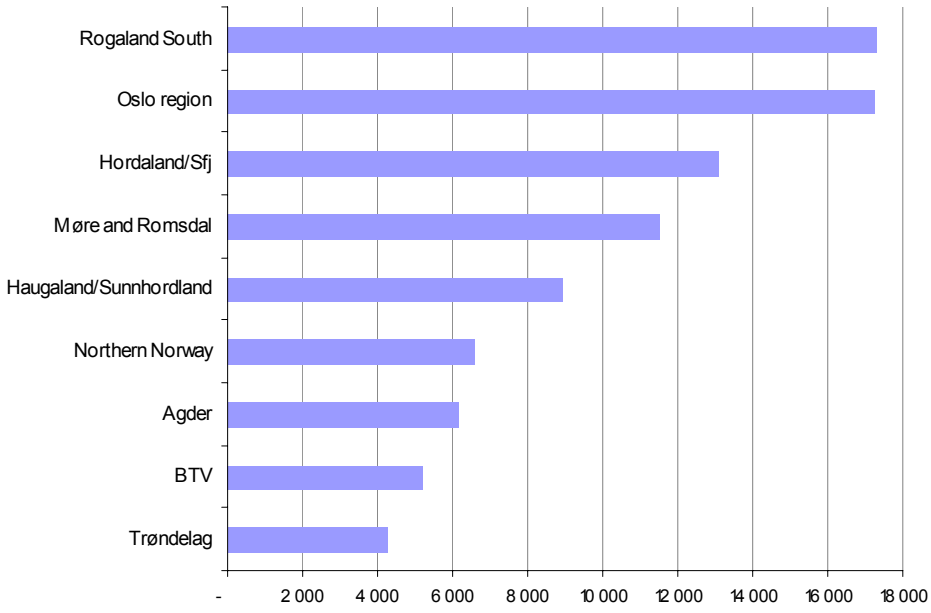
Figure 4 Value creation among the four main groups of maritime firms. Average 2002-2004, numbers in MNOK.



Employment

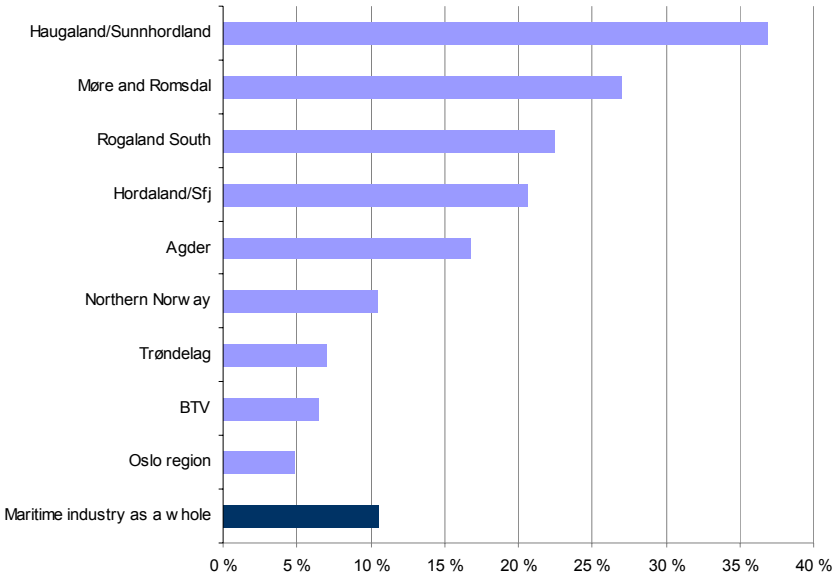
The maritime industry in Norway is a substantial employer, with around 90.000 workers onshore in 2004. However, the numbers were even higher some years ago, with a peak in 2000 with 107.000 employed. Figure 5 shows how the 90.000 people of the industry are divided over the nine maritime regions.

Figure 5 Number of employees in the Norwegian maritime industry. Dispersed on 9 regions



Rogaland South (the Stavanger area) and Oslo are the two largest maritime regions in Norway measured in number of employees. However, if we look at the importance of maritime activities for the regions, the picture changes dramatically (Figure 6). In Haugaland/Sunnhordland wages paid to employees in the maritime industry make up 37 percent of all wages paid in the region. Also in Møre and Romsdal, an important ship manufacturing region, maritime firms pay out more than one fourth of all wages.

Figure 6 Maritime share of total wage costs in nine regions



Summing up, the maritime industry is a large and important industry in Norway. In some regions, maritime activities are the cornerstone of industrial activities. The industry has been continuously adapting to new demands, technologies and environmental conditions. Today a substantial share of maritime activities, both shipping, manufacturing and service provision, are oriented towards the oil and gas industry. This ability to transform to new challenges is one of the vital strengths of the maritime industry in Norway. Let us look at other competitive factors of the industry.

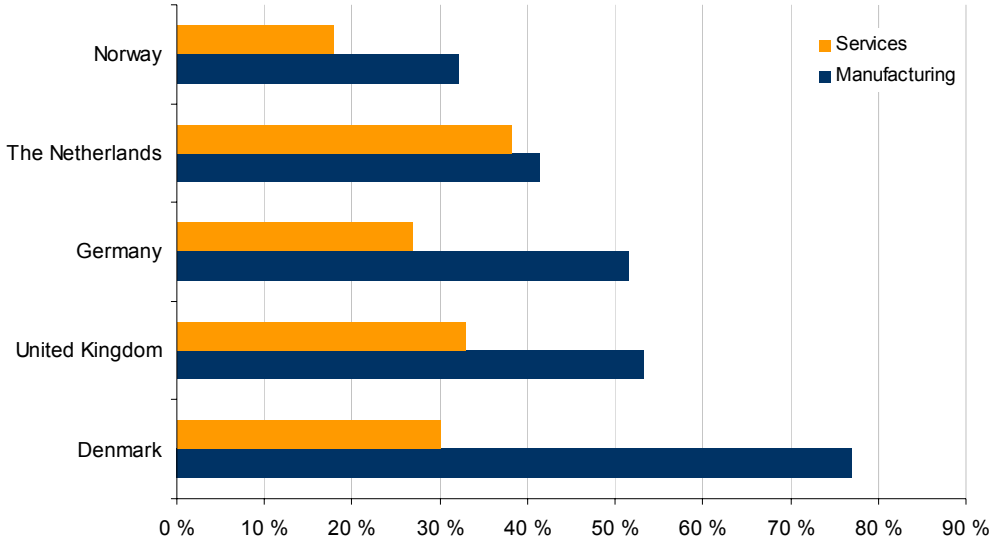
4.4 Key competitive factors of the industry

The maritime industry is the only industry in Norway that is both global and competence based. Phrased differently, the maritime cluster in Norway consists of *glocal* firms, which means that they operate in a *global* market place, but from a *local* footing. Companies are located in Norway to be part of the dynamic and innovative environment of shipping companies, financial service firms, brokers, ship consultants, legal firms and underwriters.

Maritime linkages

Of the internationalised industries in Norway, maritime is the most decentralized geographically. While oil & gas is concentrated around Stavanger and ICT around Oslo, maritime business is spread along the entire coast line from the south east to the north. There are, however, important differences in the maritime structure in each region, and it seems like the variation has increased in recent years (Hervik og Jakobsen, 2001). This geographical specialization, combined with strong national and international linkages, is an important competitive strength of the maritime industry in Norway. The research project European Maritime Benchmark (Jakobsen et al 2003) included a comprehensive study of the cluster linkages in five maritime countries. Figure 7 shows the percentage of companies having no or weak maritime linkages. In Norway 30 percent of the manufacturing companies, and less than 20 percent of service companies, have no or weak linkages to other maritime companies. The corresponding figure for Danish manufacturing companies is more than 75 percent. The difference illustrates that the maritime companies in Norway are tightly linked, particularly on a regional level, but also on a national level. In addition an increasing number of Norwegian companies have branches, alliances and other relationships with companies in a large number of countries. This was also documented in Jakobsen et al, 2003.
The completeness and the cluster linkages are probably the strongest asset of the Norwegian maritime industry.

Figure 7 - Share of maritime firms in five countries that have no or weak linkages to other maritime firms.

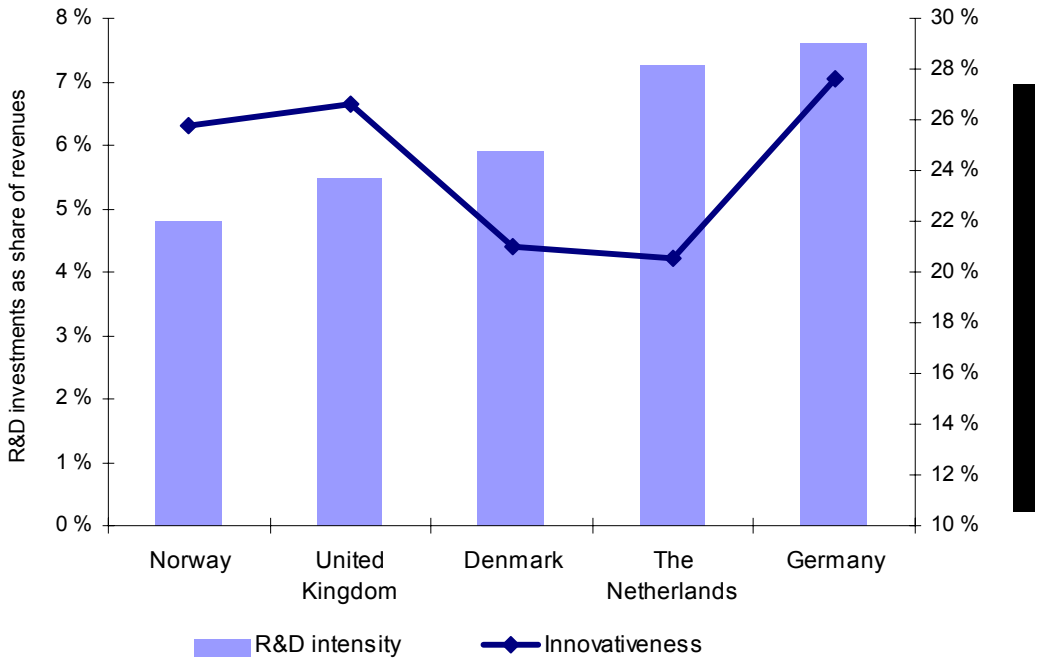


Innovativeness, but not R&D

The Norwegian maritime industry is the source of many important innovations in for example ship design, navigation, and advanced equipment. Norway seems also to be quite attractive as a location of R&D (Jakobsen et al 2003). Thus, it seems reasonable

to expect maritime companies in Norway to be quite R&D intensive. However, compared with Dutch, German, Danish and British firms, Norwegians are the least R&D intensive, something revealed in Figure 8. The innovation level is, however, quite high. This seems to imply that Norwegian companies get higher returns from their R&D investments than companies in the other countries do. A possible explanation for this is that the national innovation pressure is higher in Norway, particularly from the offshore sector, but also from the fishery fleet. Another explanation may be that innovation activities in the Norwegian cluster are different from the other countries; more specialised R&D suppliers, stronger national cluster linkages and richer communication is leading to more rapid diffusion of innovations. Actually, half of the Norwegian companies cooperate with other firms around R&D, and the supplier-buyer cooperation to improve innovation is particularly strong. 61 percent of manufacturing firms cooperate with their customers in innovation activities, a substantially higher share than the other countries. This, combined with the fact that Norwegian firms to a larger extent participate in external R&D projects and to a lesser extent conduct R&D in-house, indicates again that the primary strength of the maritime industry is not in the single companies but in the cluster as a whole. A final factor contributing to this conclusion is that Norwegian companies are more satisfied with the quality of maritime research institutions than companies in all the four other countries are. Hence, strong cluster linkages seem to improve the innovation effects of R&D.

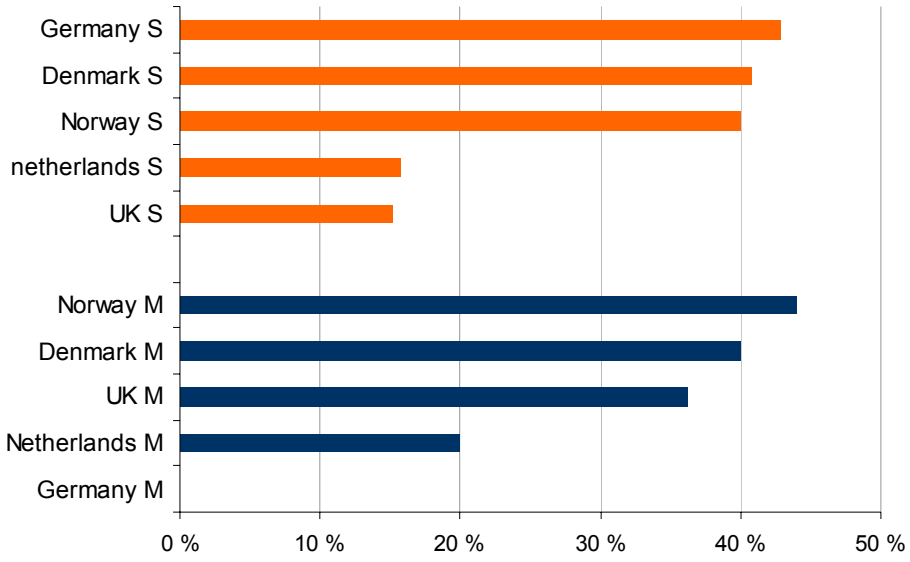
Figure 8 - Share of revenues invested in R&D compared with level of innovativeness in five national maritime industries.



Preparing for a competence based future

Although the innovation level in the maritime industry in Norway is still high, there is a growing understanding among the companies that they have to become more knowledge intensive by placing more emphasis on R&D and competence development. Figure 9 shows how investments in human resources has been neglected. Almost half of the Norwegian firms invest less than 1 percent of their revenues in competence development. The corresponding share among German yards and equipment producers is 0 – zero.

Figure 9 - Share of companies that invest less than 1 percent of revenues on competence building. S=services (shipping and maritime services); M=manufacturing (yards and equipment)



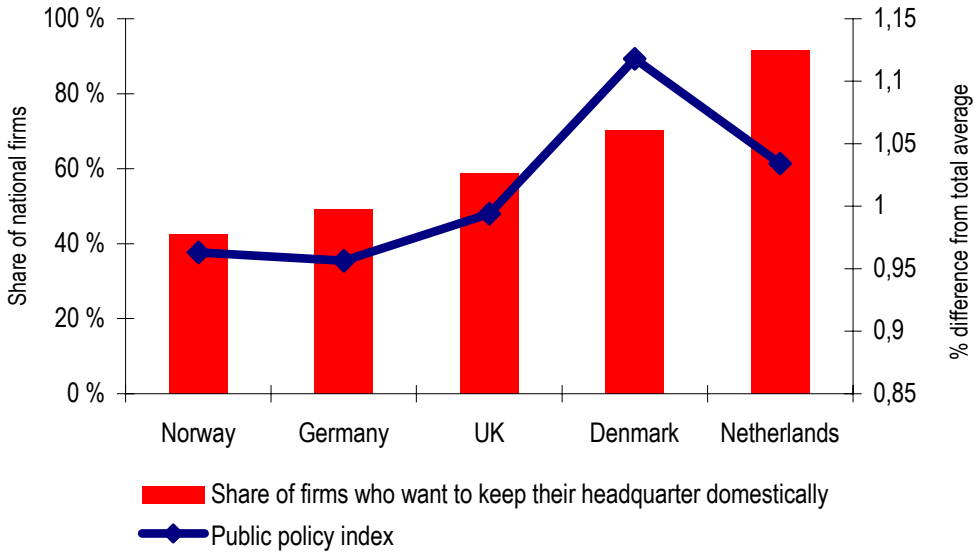
Recently, several initiatives have been taken to catch up with the R&D and knowledge investments in other leading maritime countries. For example, NSA (Norwegian Shipowning Association) has launched a cluster based maritime trainee program. 21 maritime firms, covering shipping, rig drilling, finance, broking, law, ship building, classification and equipment, participate in the program. The program has been an enormous success, with 4000 applications from recently graduated masters in business, technology and law. The 25 trainees that passed the eye of the needle have to go through the first of two years, and a new round of the program will start when the first is completed. The trainee program is particularly interesting because it is a cluster initiative, both building on and strengthening the linkages of the industry – without any kind of governmental involvement.

4.5 Maritime Cluster policy in Norway

Norwegian politicians have also taken initiatives to improve the competitiveness of the maritime industry in Norway. Marut, established by the cluster organizations in cooperation with several governmental bodies, is the umbrella name of a number of actions aiming to stimulate competence, R&D and innovation in the industry. Marut

covers seven different areas, like coastal gas, seafood and maritime ICT. Inspired by insight from cluster theory it aims to stimulate innovation by building arenas for cooperation and communication.
However fruitful these initiatives are, the long-term competitiveness of the maritime industry in Norway is dependent on the attractiveness of Norway as a host for maritime business. The attractiveness is a function of several factors, like the availability of competence and specialized and goods and services, but also on the policy conditions of the country compared with alternative locations. This is illustrated in Figure 10, which shows a strong relationship between companies' perception of public policy and their location preferences. In 2003 Norwegian companies were less satisfied with their domestic head quarter location, and together with Germany, they were least satisfied with the public policy of their country.

Figure 10 - Relationship between preferences for keeping headquarter in home country and satisfaction with public policy. Source: Jakobsen et al 2003



In the spring of 2004 the government presented a white paper on the future of the maritime industry. The white paper concluded with an ambition to sustain and hopefully improve the competitiveness of the maritime industry in Norway. The most controversial political issues, subsidies for Norwegian seafarers and the company tax for shipowners were left unresolved. The first of these issues reached a solution in the Parliament, while the latter was evaluated by an expert group working on mandate from the Ministry of Finance. The group concluded that the special treatment of shipping companies lacks roots in economic theory and suggested that shipping companies should be subject to ordinary company taxation. Their main argument is that cluster characteristics or international capital mobility is not a sound argument for tax subsidies. While writing this, the jury is still out, and the future of shipping and maritime activities in Norway is uncertain. Hopefully, Norway will continue its' role as one of the most innovative, environmental friendly and leading maritime countries of the world.

4.6 References

Benito, G. (2000). *Den maritime sektor i Norge sett i et klyngeperspektiv*. Sandvika, BI-rapport nr 8.

Hervik, A. and E. W. Jakobsen (2001). *Det regionale maritime Norge: en vital nasjonal næring med regionale særpreg*. Sandvika, Handelshøyskolen BI Institutt for strategi.

Hervik, A (2003). *Utviklingen i de maritime næringer i Møre og Romsdal. Status år 2003*. Møreforskning, rapport 0308.

Jakobsen, E. W., A. Mortensen, et al. (2003). *Attracting the winners - the competitiveness of five European maritime industries*. Oslo, Kolofon.

Jakobsen, (2005): Verdiskaping i maritim næring. Menon

Rederiskatteutvalget (2006):

Bakka, Dag Jr (2006): A wounded giant. Lloyds Shipping Magazine June 2006.

5. The Italian Maritime Cluster

***by Corrado Antonini*[22]**

5.1 Introduction

Founded in May 1994, the Federazione del Mare – *Italian Maritime Cluster - today brings together a large part of the maritime organisations* – AIDIM *(maritime law),* ANCIP *(port-operators),* ANIA *(insurance),* ASSOPORTI *(port administration),* ASSONAVE *(shipbuilding),* ASSORIMORCHIATORI *(port towage)* CONFITARMA *and* FEDARLINEA *(merchant shipping),* FEDERAGENTI *(maritime agency and brokerage),* FEDEPILOTI *(port pilotage),* FEDERPESCA *(fishing navigation),* IPSEMA *(maritime welfare),* RINA *(certification and classification),* TMCR *(promotion of coastal shipping) and* UCINA *(leisure-boating industry) – with the purpose of representing the maritime world in a unified manner, so as to increase awareness of its role as a factor of development, while highlighting its shared values, culture and interests, which also arise from constant contact with international activities.*

The most significant product of the Federazione del Mare in 2006 was the *3rd Report on the Economy of the Sea,* presented in the month of June.
The Report analyses the economic and social impact of the Italian Maritime Cluster, viewed in terms of its main productive and institutional components.

The Report also addresses the topics of training and the environment.
With regard to training, an attempt is made, for the first time in Italy, to outline in a unified and fully integrated manner what is being done to improve the preparation of young people who dedicate themselves to professions connected with the sea, whether onboard or on land.
As for the environment, the Report points to the best practices that have been implemented in the different maritime sectors for the purpose of combining in a constructive manner development with respect for the environment.

In more general terms, I find the interrelations between the new European maritime policy –as illustrated in the recently presented Green Paper – and the activities of the Federazione del Mare to be of particular interest.

In fact, the need for an all-encompassing, synergistic, across-the-board approach to maritime issues – something the Federazione has been supporting since its founding in 1994 – is now being acknowledged and encouraged at the highest levels of both the European Community and Italy.

The approach in question calls on the Federazione to achieve a more compact, stronger form of integration between the federated organisations, extending beyond

[22] Mr Corrado Antonini is Chairman of Federazione del Mare, the Italian cluster of maritime activities.

the areas that have been addressed to date, though always with undiminished respect for the specific expertise and prerogatives of the individual sectors.

5.2 All the value of the Italian maritime system

For some time now, the Italian economy has registered phases of limited expansion, or even drops in the growth rate. The system of maritime activities, on the other hand, continues to post what could be considered an *anti-cyclical* performance: fishing activities have progressively increased, in terms of production, while the manufacturing components (naval construction and repair, plus the construction of leisure vessels) show a marked capacity to withstand the turbulence and the clear-cut rise in the level of competition on their markets, at the same time as the tertiary sectors (maritime transport, the movement of cargo, the logistical cycle of cargo between the land and the sea, technical-nautical services, financial services and specialised insurance services) have increased their standards of quality, innovated the various components of their offerings (especially with regard to activities involving port operations and logistics) and raised their levels of efficiency.
It is this capacity to support the transformations made necessary by a globalised economy, as well as the reorganisation of production processes inside the industrial framework, together with processes of logistics and transport, that demonstrates the marked modernity of the Italian maritime cluster, whose highly original model of development accounts for 2.7% of the national GDP, while involving 1.6% of total employment (**tab. 1**).

Table 1 – Main economic aggregates of the maritime cluster *. Figures for 2004

	Absolute figures	% of total for Italy
GDP, not including duplications (millions of €)	36,518	2.7
Intermediate costs and gross fixed investments (millions of €)	11,616	4.4
Exports (millions of €)	14,088	4.7
CIF imports (millions of €)	4,046	1.4
Total labour units (direct, upstream and downstream)	394,950	1.6

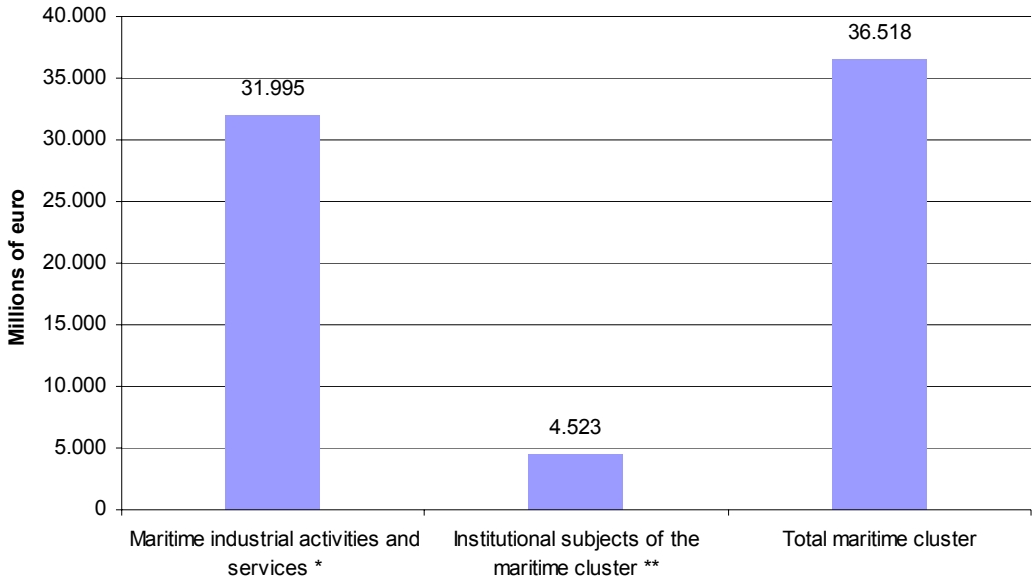
(*) The cluster includes industrial and service activities, as well as institutional subjects, plus the wealth generated by the tourist activities tied to leisure boating
Source: Censis processing of data from Istat, Assonave, Ucina, Ipsema, Rina and Assoporti

Taken altogether, the sectors of maritime transport, plus activities involving port logistics and assistance in transport, together with naval construction, the construction of leisure boats, fishing activities, the Italian Navy, the harbourmasters' offices, the port authorities and Ipsema, generate 36.5 billion euro (**fig. 1**). What is more, the cluster sets in motion spending of more than 11.6 billion euro on intermediate consumption and gross fixed investments, equal to 4.2% of the investments registered in Italy, clear-cut evidence of its capacity to mobilise and utilise the noteworthy economic resources necessary for the direct performance of the

activities typical of each sector, with a multiplying effect that benefits the entire national system of production.

PLEASE NOTE: in the following figures, commas (,) and dots (.) as specifying thousands and decimals in English language are inverted according to Italian usage.

Fig - 1 - GDP of the Italian maritime cluster, figures in millions of current euro. Data for 2004



* Includes the following sectors: maritime transport, activities of port logistics and services assisting maritime transport, naval construction and the construction of leisure vessels (plus the ancillary economic activity tied to nautical tourism) and fishing.

** Includes: the Italian Navy, the harbourmasters' offices, the port authorities and the Ipsema.

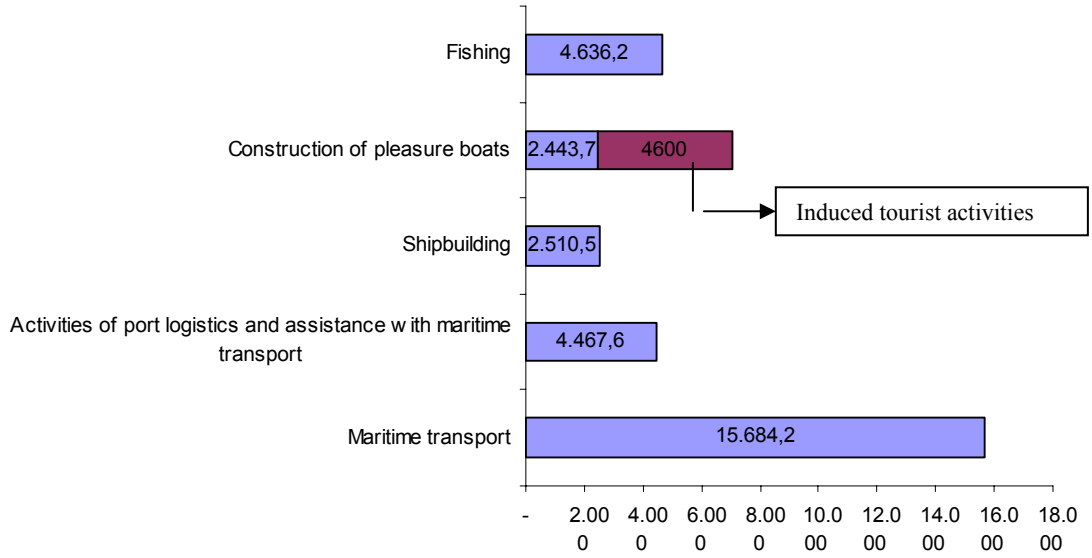
Source: Censis processing of data from Istat, Assonave, Ucina, Ipsema and Assoporti

The estimate of the GDP[23] of each sector for the year 2004 (**fig. 2**) points to noteworthy differences within the maritime cluster. Maritime transport, with a GDP of 15.684 billion euro, currently accounts for 53% of all the wealth generated by the maritime manufacturing and tertiary activities considered herein, showing itself to be closely connected to port activities and operations involving assistance to the transport system, whose gross domestic product amounts to 4.467 billion euro. The gross domestic product of naval construction and fishing are equal to respective figures of 2.510 and 4.436 billion euro. Finally, the contribution of leisure boating, not including the ancillary economic activity generated by nautical tourism, was 2.443 billion euro, to which the amount generated by tourism, equal to 4.6 billion, must be added. Figures at lower levels, but still of note, characterise the institutional

[23] Calculated as the value of goods and services produced at base prices and at current values, after deducting the value of imports.

sectors, such as the Italian Navy, which registers a GDP of more than 2 billion euro, together with interesting levels of productivity.
A cross-analysis of the gross domestic product of industrial maritime activities and services with the figures for a number of economic branches (**fig. 3**) further highlights the undeniable importance, in absolute terms, of the Italian maritime cluster.

Fig. 2 - GDP of the industrial and service sectors* of the maritime cluster



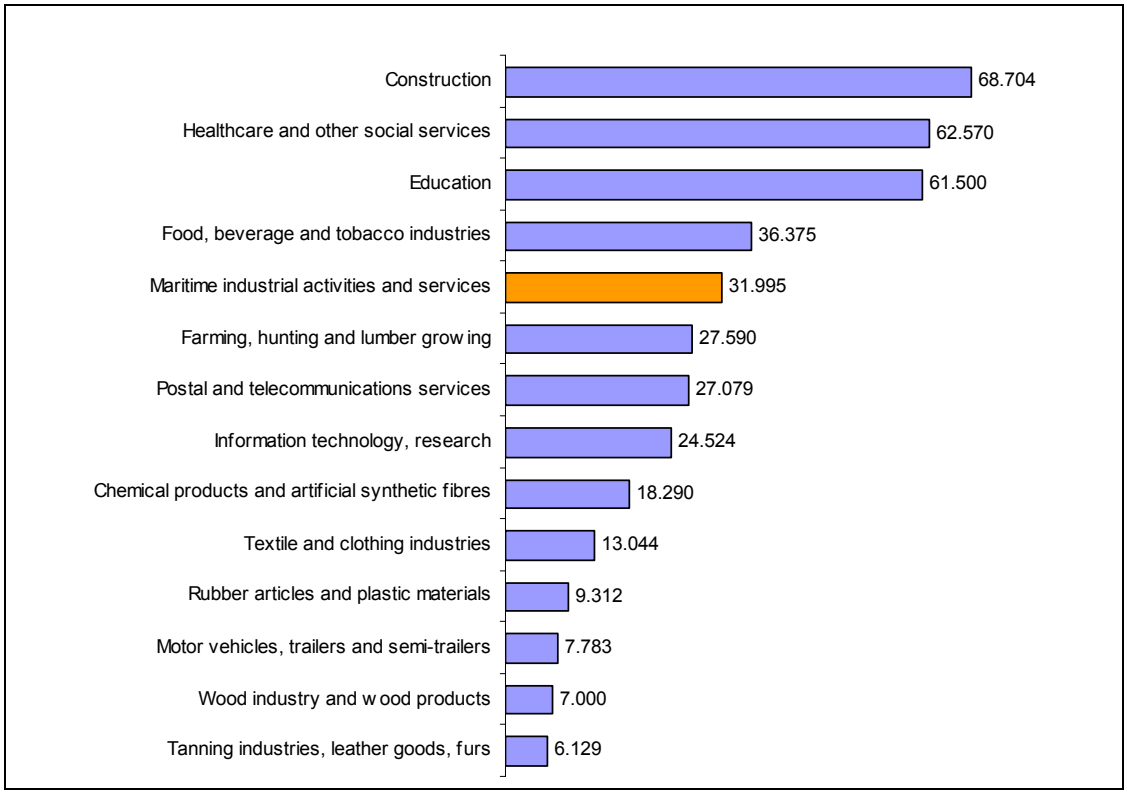
* The data refer to the following sectors: maritime transport, activities of port logistics and assistance with maritime transport, naval construction and leisure boating (including the resulting tourist activities), plus fishing.

The excellent economic-production performance registered in recent years by the different segments of the cluster, together with the noteworthy levels of employment that set them apart, place productivity at elevated figures, among the highest in Italy. The capacity of maritime industrial and service activities to absorb elements of the workforce proves considerable: the number of workers directly employed in 2004 totalled 122,386 units, in addition to which there were 106,927 units employed upstream of maritime operations and 104,297 units downstream, including 68,394 associated with ancillary activities tied to pleasure boating (**tab. 2**).
Looking at maritime industrial and service activities as a whole, the value added per labour unit is 101,000 euro (**fig. 4**).

Tab. 2 - Labour units in the industrial and service activities of the maritime cluster. Data for 2004

	Direct labour units	Labour units upstream and downstream	Total labour units
Maritime transport	26,300	60,006	86,306
Activities of port logistics and assistance with maritime transport	26,048	17,487	43,534
Shipbuilding	12,033	14,747	26,780
Pleasure boating (with related tourism)	11,719	80,859	92,578
Pleasure boating (without related tourism)	*11,719*	*12,133*	*23,853*
Fishing	46,286	38,125	84,411
Total	122,386	211,224	333,609
Total net of duplicated activities among sectors			*318,484*
Source: Censis processing of data from Istat, Ucina and Assonave			

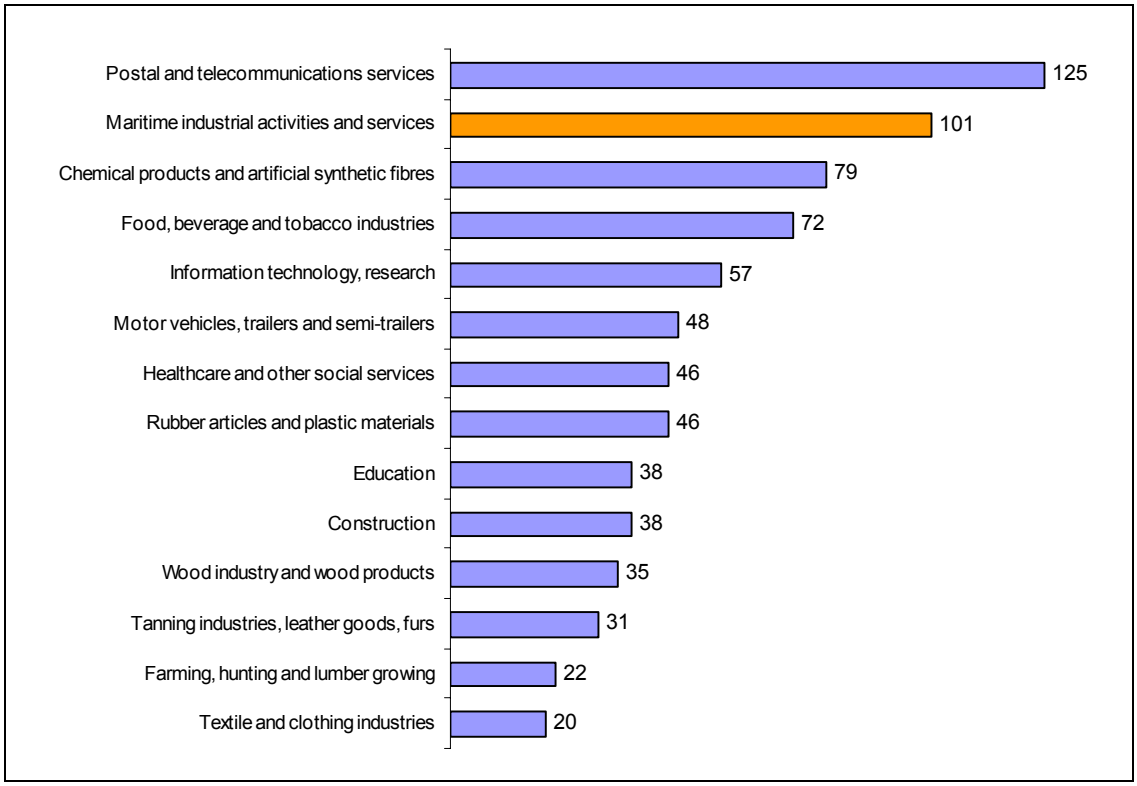
Fig. 3 – Gross Domestic Product at basis prices: comparison between maritime industrial activities and services* and other economic sectors (billions of euro). Data for 2004



(*) The data refer to the following sectors: maritime transport, activities of port logistics and assistance to maritime transport, naval construction, pleasure boating (including connected tourist activities) and fishing.

Source: Censis processing of data from Istat, Ucina and Assonave

Fig. 4. - Value added per direct labour unit: comparison between maritime industrial activities and services* and other economic sectors (in thousands of euro). Data for 2004



(*) The data refer to the following sectors: maritime transport, activities of port logistics and assistance with maritime transport, naval construction, pleasure boating (including associated tourist activities) and fishing.

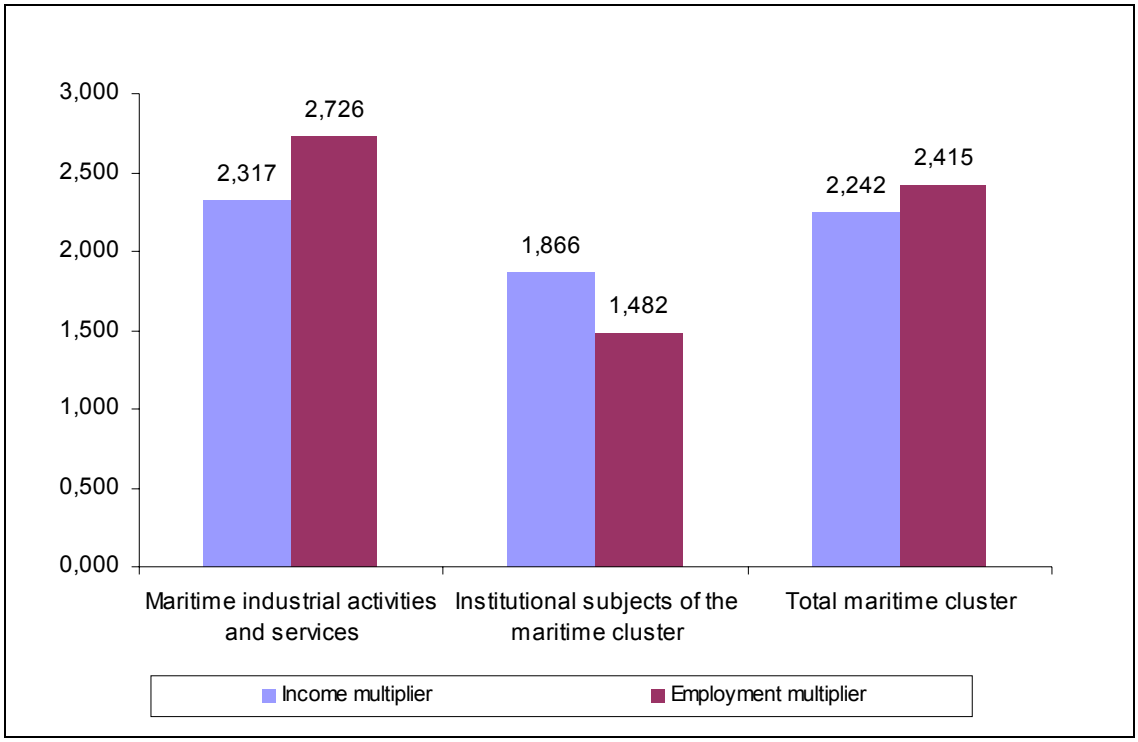
Source: Censis processing of data from Istat, Assonave, Ucina, Ipsema and Assoporti

There are also noteworthy multiplying effects in terms of income and employment, thanks to the existing ties between the components of the cluster (which increasingly resembles an industrial chain, in which each sector takes part in a broader production process) and between the cluster itself and additional sectors upstream and downstream of maritime activities (**fig. 5**). At present:

- 100 euro of additional demand for goods and services generate 224 euro of income in the national economic system;

- 100 new labour units operating in the maritime cluster trigger the creation of 241 labour units in the national economy.

Fig. 5 - Multipliers of income and employment in the Italian maritime cluster. Data for 2004



Source: Censis processing of data from Istat, Assonave and Ipsema.

What is more, the industrial and service activities, taken as a whole, register a greater multiplying capacity than that of institutional subjects.

5.3 Modernity and flexibility of a network system

The maritime cluster, viewed in its entirety, proves to be modern in nature, given the central role it increasingly plays in the country's productive structure, as well as the internal differentiations and, last but not least, the capacity to serve as the driving force behind a system of *highly flexible networks of business and trade*.

The last few years – characterised by a marked expansion in the economic weight of the maritime system and the importance of the seaborne transport of imported and exported cargo, as compared to other modes of trade – have given the cluster a role of central economic importance that appears all the more evident when analysed in parallel with the deindustrialisation trends registered by the country over the last 15 years.

The maritime system's multifaceted nature – a result of the combination of production activities tied to manufacturing (shipbuilding and pleasure boating) and services (activities of transport, port management services, services performed by terminal operators and maritime agents, technical-nautical services and services of control, performance testing and certification) – has proven to be its *efficient configuration*, capable of creating profitability and maintaining the growth of

production and employment at elevated levels. Also worthy of note are the marked correlations that exist:

- between maritime activities carried out on the market (maritime transport, services tied to the port cycle, shipbuilding, nautical production and fishing) and those performed by subjects with a role of control, direct administration or insurance of the working activities, such as: the Italian Navy, the harbourmaster's offices, the port authorities and the Ipsema. These last guarantee an infrastructural context in which industrial and tertiary maritime activities can develop;
- between the cluster and additional sectors, often characterised by a high level of value added, such as the banking and financial system, as well as the insurance system. The major investment programs of ship-owning companies, together with the construction of large cruise ships, a sector in which Italian shipbuilders are meeting with success, has come to require a financial contribution so specialised and significant – given the elevated level of the initial investment – that commitments on the part of major banking groups are necessary. A noteworthy contribution is made by the insurance system (which participates through the Ania in the Federazione del Mare), for which the maritime cluster constitutes an important market area. In fact, the Italian maritime system acquires more than 250 million of euro of insurance services (2% of the intermediary purchases), demonstrating the importance of this type of service in the proper performance of maritime activities.

And there can be no ignoring a further, highly significant aspect of the cluster: namely the fact that it contains a system of *intrinsically flexible networks* that take on different forms, ranging from production districts to transport routes.

In a number of sectors, such as naval construction and pleasure boating, *the network enterprise* or, to an even greater extent, the industrial district, constitutes an efficient production model in which the coordination between different companies located in the same territorial area makes possible the activation of informal networks of knowledge, the circulation of professional figures and the birth of new business initiatives; La Spezia, Viareggio and Massa Carrara, as well as the coastal area between Gaeta and the Argentario district, are full-fledged pleasure-boating districts. But even commercial ports constitute the centre of gravity of networks of extremely different activities and professional resources. Business networks normally result in the acceleration of growth, with a multiplying effect on income, which is why they are supported with specially targeted policies and initiatives.

A second aspect to be taken into account is the fact that commercial port activities and maritime transport operators generate and operate within an extensive system of networks consisting of routes. Today, these present multiple forms, consisting of:

- energy networks, through transport carried out by oil tankers, dry bulk carriers and gas and chemical tankers;

- networks of key raw materials for industry; to provide only a few examples, 41% of the value of minerals for metallurgy, 41% of metallurgical products and 53% of raw minerals and construction materials are imported by sea;
- networks of high value added products, by means of containers and Ro-Ro ferries;
- passenger transport networks: in 2004, more than 40 million passengers passed through Italian ports.

One of the main advantages of this network system is its flexibility and capacity for rapid extension and adjustment to the ongoing development of cargo trade, something that cannot be accomplished, to the same extent, by land-based transportation infrastructures; it is for these simple motives, as well as the need to preserve the regulatory, tax-related and social-security conditions that allow Italian ships to be competitive, that investments should be increased in all those processes and factors able to increase the strength and efficiency of maritime transport and ports, key logistical junctures for the country.

5.4 Ripple effect

Operating under a network logic, with noteworthy interconnections between sectors and operators that are often very different from one another, the Italian maritime system triggers economic processes which, at times, have a wide-ranging effect, influencing each other. Based on the large volume of data collected, it can be stated that the maritime cluster is capable of generating:

a) *effects on income*, by making a noteworthy contribution to the Italian GDP; an apt example is the fact that 100 euro of additional demand for the goods or services of the maritime cluster generates 224 euro of new income in the national economic system;

b) *the development of financial circuits*, thanks to the fact that the maritime cluster has the configuration of an investment-intensive macro-sector, in which the financial and insurance systems play a noteworthy role, contributing to its development. The services of monetary and financial brokering drawn on by the industrial and service activities of the cluster total 494 million euro, equal to 1.7% of the production value. The value of the insurance services total 250 million euro;

c) *contributions to development of the labour factor,* with a wide variety of professional figures and a noteworthy impact on employment, both direct and indirect, registered in the sectors upstream and downstream of the production processes;

d) *processes supporting the opening up of the country to international trade*, taking into consideration that the vast majority of the quantities of goods imported and exported to and from our country are transported by sea, and that the cluster generates a noteworthy portion of total Italian exports;

e) *a modernisation of the national supply of logistics*, thanks to the role played by maritime transport operators (the transport of individuals and the distribution of merchandise) and to the role of Italy's system of commercial ports and port authorities, currently engaged in activities of investment and modernisation of the services offered, with an impact of decided relevance on both employment and the territorial area where each port is found;

f) *contributions to maintaining the competitive strength of the entire national production system*; during phases of deindustrialisation, such as those recently registered in Italy, the current growth of the merchant and cruise navigation industries, as well as that of pleasure boating, together with the repositioning and making of new investments in merchant shipbuilding, provide an idea of the capacity of the cluster to contribute to the growth of the Country System; the increase in the percentage of the national GDP accounted for by the maritime cluster, from 2.4% to 2.7% between 2001 and 2004, is a tangible demonstration; at the same time, the marked correlations between industrial activities (shipbuilding, nautical operations, components, mechanics) and service operations (port logistics, transportation and auxiliary activities, the management of terminals, storage, the activities of port authorities, harbour masters' offices and the Italian Navy, to name only a few) point to a modern, efficient way of doing business, thanks to the tertiary component, which is generally capable of renewing itself very rapidly.

What is stated above throws renewed attention on the need to reinforce an all-encompassing policy enacted through different initiatives, differentiated objectives of development and a revival of investments in both the system hardware (tangible infrastructures) and the software, starting with the human capital. The Federazione del Mare and its member organisations have long been engaged in drawing up strategic guidelines and initiatives aimed at sensitive areas of the cluster; the government forces are responsible for guaranteeing continuity of the initiatives of key importance to maintaining the competitive strength of the Italian maritime system.

5.5 A look at the future

In light of the economic impact referred to up to this point, it is only natural that the question of the future course of the Italian maritime cluster should arise.

Looking at the short term, it is safe to say that there will be further growth, and that the role of the maritime system as a pivotal factor in the growth of the national economy shall be reinforced. Looking at the quantities of merchandise imported to and exported from Italy, respective levels of 63% and 46% travel by sea. Limiting the analysis to Italy's trade with countries outside of the European Union, the maritime mode plays an even more important role: more than 80% of the quantity of merchandise imported to Italy and 80% of the exports currently travel by sea, making the maritime transport sector a key system of carriers and giving ports the status of critical junctures in the network of trade of which Italy is a part. Italy ranks first among the countries of the 25-member European Union in terms of merchandise imported from outside the EU by sea (with more than 206 million tons of

merchandise, placing it far ahead of Spain, rated second, and of the United Kingdom, third on the list); giving that the merchandise, for the most part, consists of raw materials used by national enterprises, there can be no mistaking the key role which maritime transport services and port and retro-port infrastructures currently play in the country's production processes. Considering, for that matter, that the most reliable estimates point to increases of at least 40% in passenger and cargo traffic over the next ten years, compared to the current levels, in addition to which, during the same period, the movement of containers in the Mediterranean, in terms of Teu, shall rise by 75%, with the units of cargo moved by Ro-Ro also forecast to grow and estimates of demand for large-scale shipbuilding and pleasure craft pointing to further expansion, the future scenario of the Italian cluster can only be one of continued growth.

Naturally, in order to back similar expansive trends, the maritime system still has need of effective accompanying actions and of unified strategies that make the most of the elements of strength of its various protagonists and its human capital. The noteworthy contribution to the formation of the national GDP makes the maritime system a key asset; in order for this role to be reinforced, and for its multiplying effect on income and employment to be increased, new and significant investments, both tangible and intangible, must still be made, for the purpose of:

- completing the legislative framework and keeping it in line with European Community guidelines, which allow Italian ships to be competitive on international markets, so as to ensure that the share of the Italian fleet in the different sectors is increasingly sizeable, in particular as regards the Ro-Ro ships and the fleet that handles the flow of energy to the country (oil, coal and gas);
- reinforcing and improving infrastructures, both inside ports and as regards a more effective linking of port junctures with railway and roadway networks;
- favouring initiatives on port junctures of vital importance to the Italian country, with a particular focus on the new demands of container traffic and those of the Highways of the Sea (short sea shipping), with one objective being to guarantee the financial independence of port authorities;
- providing incentives for and sustain the presence of top-flight Italian shipbuilding and nautical production activities on the main foreign markets;
- supporting processes of technological innovation and research and development, currently of key importance in a number of sectors whose competitive advantage is based technology-intensive production activities (cruising, towing vessels, super yachts);
- activating focussed programs for the upgrading and growth of the skills of the multiple professional figures at the disposal of the maritime cluster;
- maintaining high levels of attention and awareness with regard to environmental concerns.

6. The Danish Maritime Cluster

***by Mogens Schröder Bech*[24]**

Introduction

Denmark has for centuries been a shipping nation and almost from the outset sailed in European as well as overseas waters. Traditionally there has been broad political consensus on supportive framework conditions for shipping in Denmark and the framework has been built in a close partnership with the industry.

For the globalisation process, shipping is a prerequisite. This counts for outsourcing of production, more global consumer demands and transport of energy and raw materials. As shipping has become an international area of growth, the Danish Government has put more and more emphasis on development of the framework conditions, trying to keep a balance between stability and adjustment.

The big oil spills accidents at sea and the vulnerable Danish Straits have created a growing public concern on shipping and safety. The Danish response has been twofold with a more intensive use of pilots, development of surveillance systems and navigational aid etc. on the one hand and putting more emphasis on the development of quality shipping through the work in the IMO and EU on the other hand.

Remarkable has been the development of the cluster thinking starting in the nineties and with the Growth Strategy for Shipping – Competences and Growth[25] from 2003 with a restructuring of the Danish maritime education system.

In thrive for development of the framework conditions for the maritime cluster a comparison of Denmark with Germany, The Netherlands, UK, Isle of Man, Greece, Cyprus, Singapore and China was made in 2005. The analysis is based on desk research and interviews with governmental agencies, private companies, organisations etc in the respective countries and has been summed up in a SWOT analysis with Strenghts, Weaknesses, Opportunities and Threats.

One of the fundamental assumptions of this work has been that the key is the existence of shipping companies undergoing growth, where commercial and technical decisions relating to current shipping operations go hand in hand with investments. These will in turn create growth opportunities for secondary maritime industries.

The analysis has been the starting point for an action plan for supporting growth in the Danish maritime cluster and was launched in the beginning of 2006 by the Danish minister for Economic and Business Affairs.

[24] Danish Maritime Authority
[25] Søfartspolitisk Vækststrategi - Kompetencer og vækst, Danish Maritime Authority.

The action plan rests on three objectives:

- Denmark should strive to become the most attractive place in Europe to operate international quality shipping.

- Conditions for growth, dynamics and competitiveness across the Danish Maritime cluster should be enhanced.

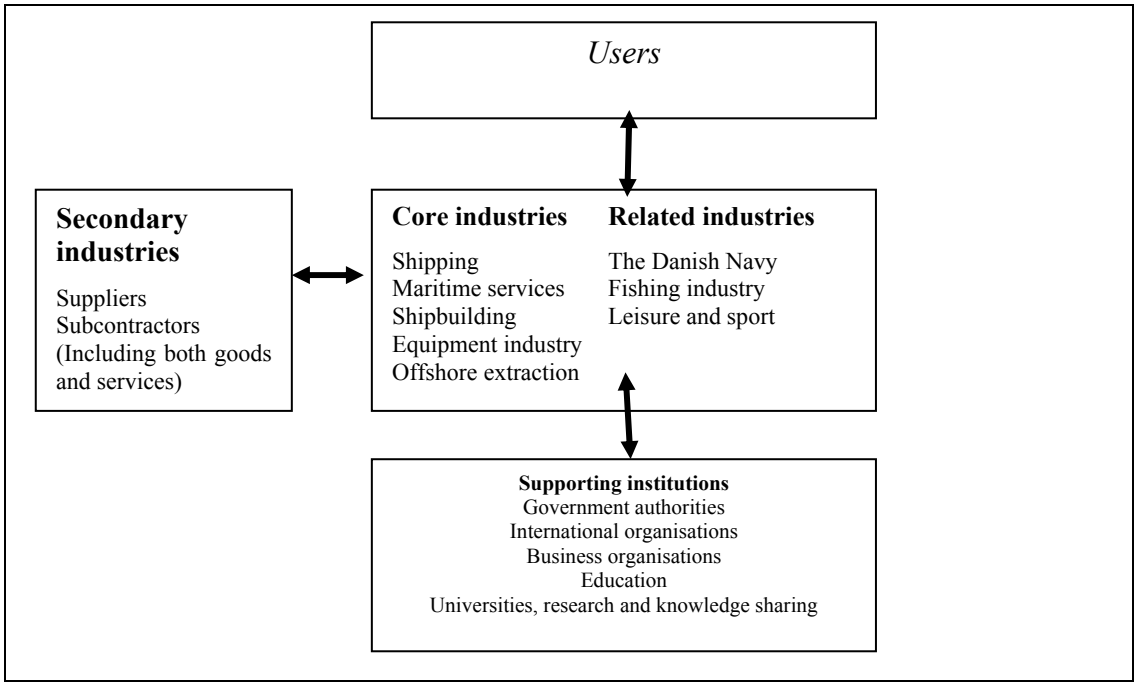
- Health, safety and environment measures on ships should be maintained and improved, so that Denmark develops as a leading maritime nation with an international focus and quality shipping.

This paper is based on the publication The Danish Maritime Cluster – an Action Plan for Growth[26] and divided into five sections: The Danish Maritime Cluster; shipping; health safety and environment; the SWOT analysis; and the action plan.

6.1 The Danish Maritime Cluster

The cluster basically comprises the industries related to transport by sea, and exploitation of the resources beneath the sea bed. In addition to the sea, the Danish Maritime Cluster is linked together around a common user group in terms of transport purchasers, trade between enterprises, exploitation of common technologies, and use of the same workforce groups. The various industries that make up the cluster are illustrated in figure 1, and include core industries, related and secondary industries, and supporting institutions.

Figure 1. The Danish Maritime Cluster



[26] The Ministry of Economic and Business Affairs, June 2006.

The analysis of the maritime cluster only includes core industries and supporting institutions. Related industries such as fishing, the navy and leisure boating have not been included. The same is true for industries that work with renewable energy at sea. Statistical data are only available for shipping and shipbuilding, and it has not been possible to carry out specific statistical surveys. It has therefore been necessary to select representative industries[27] for the other industries in the cluster.

The key economic figures for the maritime cluster are shown in table 2.

Table 2. Key figures (2002) for the maritime cluster

Industry	Production value	Gross Value Added	Gross Domestic Product at factor cost	Number employed	Direct exports	Export share – direct and indirect (%)
Shipping	89,722	14,952	15,038	14,815	86,681[28]	96.3
Maritime services	33,776	18,174	18,224	32,460	n.a.	n.a.
Shipbuilding	7,587	1,875	1,880	6,524	883	54.8
Equipment production	19,386	8,980	9,001	20,626	15,535	83.6
Off shore resource extraction	33,845	29,507	29,544	1,287	10,480	79.6
Total for the maritime cluster	193,308	73,488	73,687	75,712	n.a.	n.a.
Total for Denmark	2,325,440	1,175,635	1,176,293	2,782,306	645,380	36.9
The maritime cluster's share (%) of the total Danish economy	8.3	6.3	6.3	2.7	17.6 minimum	n.a.

The amounts shown are in DKK million[29]. Source: Statistics Denmark, Input-output tables and analyses. The information on direct exports for the industries has been derived from special queries run at Statistics Denmark, while the total exports have been taken from Statistics Denmark's Statistical Ten-Year Review.

The maritime cluster accounts for just over six per cent of the total value added in Denmark. Offshore extraction has a large value added and a very small labour force. If one excludes extraction, shipping accounts for 34 per cent of value added and 20 per cent of the labour force, while the other industries have a lower percentage contribution to value added than to employment. This reflects the highly capital-intensive nature of shipping.

The maritime cluster is far more export-oriented[30] *than other Danish industries.*

[27] Proxy industries

[28] This export figure is approximate, as the sources are not identical. Source: Statistics Denmark (in both cases).

[29] The conversion rate of the Danish Krone to the Euro is 1 DKK = € 0,13 / 1 € = 7,5 DKK

[30] The export component here includes both direct exports and sub-supplies to companies that export.

In order to assess the complete significance of the maritime cluster for Denmark, the derived significance for other industries must be calculated. This is shown in table 3.

Table 3. Direct and indirect production and employment (2002)

Industry		Production (DKK million)	Employment ('000)
Shipping	Direct	89,722	14,815
	Direct and indirect	93,922	18,896
Maritime services	Direct	33,776	32,460
	Direct and indirect	46,790	44,765
Shipbuilding	Direct	7,587	6,524
	Direct and indirect	11,854	10,932
Equipment industry	Direct	19,386	20,626
	Direct and indirect	27,397	28,800
Offshore extraction	Direct	33,845	1,287
	Direct and indirect	36,181	3,521
Total for maritime cluster	Direct	184,316	75,712
	Direct and indirect	216,144	106,914
% of Danish economy	Direct	7.9	2.8
	Direct and indirect	9.3	3.9

It can be seen that the maritime cluster has a significant indirect impact on the Danish economy.

The strongest interdependency in the Danish Maritime Cluster is the socio-economic element, and education and a common labour market in particular. The fact that maritime officers return to land after serving a certain period on ships, and take up employment in the shipping companies' land-based organisations and in the other maritime industries, is seen as an important driver for growth.

A number of maritime parties highlight the Danish Maritime Authority as an important factor for increasing interaction and dynamics in the maritime cluster.

Innovation is also seen as an important driver for greater interaction. For many maritime enterprises, user-driven innovation is the dominant element. Here, it is the dialogue between suppliers and the customer that contributes to the development of processes and products. In other areas, emphasis is on research-driven innovation – where research is the focal point. There are many examples of these types of innovation, but there is a need for further enhancement. Cluster enterprises increasingly highlight the need to develop the right skills, if they are to continue to be able to operate from Denmark. This is necessary in order to be able to manage the innovation processes.

A broad range of enterprises is encompassed by the cluster industries. This applies in terms both of size and representation within the various industry segments, and an export focus is an important factor. With regard to the medium and large enterprises, in addition to sales and production abroad establishment of global service schemes are often a prerequisite for market participation. Several Danish maritime enterprises are seen as leaders within their area[31].

In 2005, the Danish Government established the Danish Maritime Trust Fund, which is intended to provide financial support for initiatives and measures that develop the maritime cluster. Research, development and innovation are key focus areas for the Trust Fund. The Trust Fund owns a number of shares in Danish Ship Finance, a private shipping finance company, and the dividends from these finance the Foundation's grants.

Denmark does not have a unified maritime cluster organisation. The work is divided between the Maritime Development Centre of Europe (MDCE), the Association for Promotion of Danish Shipping and the Danish Society for Naval Architecture and Marine Engineering. The strength of this structure is the voluntary commitment in each association, with coordination via a common secretariat. The Danish Maritime Authority also works closely with the three associations and the secretariat.

Activities revolve around professional and interdisciplinary network building, conferences, seminars, knowledge-sharing, innovation and information activities. Financing derives from membership contributions and foundations, etc.

The boards of these associations are made up of leading figures and directors within the maritime industries, the transport sector and trade associations, etc.

6.2 Danish Shipping

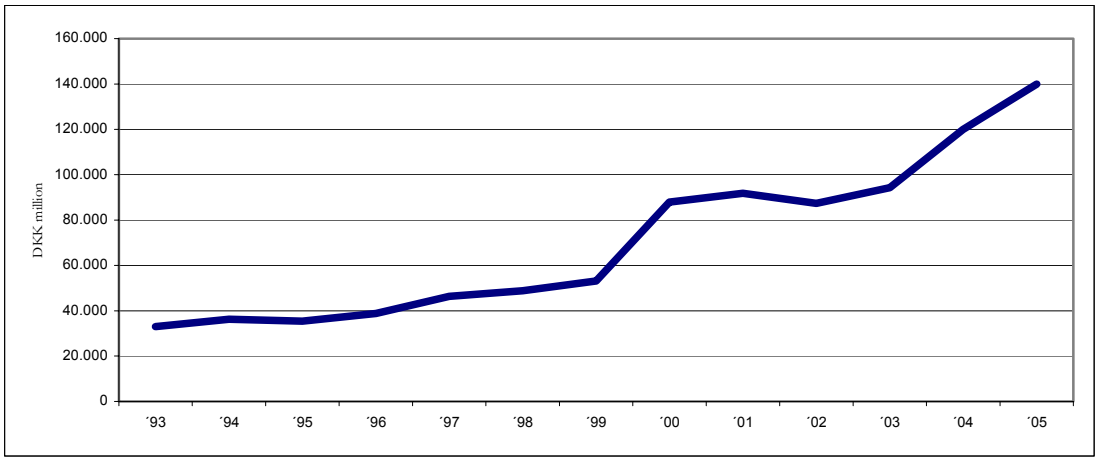
Foreign currency earnings

Danish shipping is one of the strongest players on the global market, and forecast gross earnings for 2005 are DKK 140 billion. The net foreign currency earnings from Danish shipping in 2004 were DKK 20 billion[32], making it a vital contributor to the Danish balance of payments surplus.

[31] In addition to the analysis associated with this project, information on interdependency has been drawn from Søfartspolitisk Vækststrategi (Maritime Policy Growth Strategy), the Danish Maritime Authority, November 2003.

[32] Calculated for this report. Source: Statistics Denmark, the Danish National Accounts and Balance of Payments, 2005:12. If one deducts bunker expenses and adds maritime transport expenses for Danish imports, the surplus increases to DKK 25 billion.

Figure 2. Gross earnings from Danish shipping in the balance of payments (1993-2005)



Source: OECD Statistics on International Trade in services. The figures for 2004-05 are estimates from the Danish Shipowners' Association.

Compared with OECD countries Denmark had the second largest export earning from shipping, only surpassed by Japan.

The merchant fleet

Trends in the owner-controlled fleet between 2001 and 2005 are shown in table 4 below. There has been a global increase in tonnage of 17 per cent, while Danish tonnage has only risen by 14 per cent, a rise that can be attributed to 2005.

At the end of 2005, almost 9.500.000 DWT were registered (see table 4). Despite a slight decline in the owner-controlled fleet from 2001 to 2004, there was an increase of more than seven per cent in the Danish registers in the period concerned. In 2005 there were increases in both the registered and owner-controlled fleets.

Table 4. The Danish fleet – '000 DWT

	End of 2001		**End of 2004**		**End of 2005**	
	Number	DWT	Number	DWT	Number	DWT
Owner-controlled	608	16,524	525	16,274	643	18,990
Danish registered	461	8,131	466	8,774	388	9,443

Summary of controlled (nationally owned) tonnage and number of ships over 1000 DWT. Denmark includes figures for DIS (Danish International Ship register) and DAS (Danish Ship register). Source: Lloyd's Register Fairplay "World Fleet Statistics" 2001, 2004 and 2005 table 2A-2I and 3A-3I.

Denmark was the world's 17th largest flag State at the end of 2005, but the 11th largest based on vessel ownership.

The difference between earnings and tonnage is due to the fact that Danish shipping companies largely use chartered ships. At the end of 2005, the total Danish chartered tonnage is estimated to have been 30 million DWT. Given that much of Danish

shipping operates in high-value markets, it is estimated that up to 10 per cent of the total turnover from global maritime goods transport is linked to Danish-owned or controlled ships[33].

The most popular foreign register for Danish shipping companies is Singapore, accounting for 14 per cent of tonnage. Denmark, Singapore, Norway and the UK account for 79 per cent of Danish registrations. Hardly any foreign shipping companies use the Danish International Ship Register – DIS.

The Danish new construction programme of 14 million DWT, as of 1 January 2006, is the fourth largest in the world. This corresponds to 74 per cent of the Danish owner-controlled fleet at the end of 2005. The three largest new construction programmes are in Japan (39 million DWT), Greece (20 million DWT), and Germany (16 million DWT)[34].

Economic framework conditions

Taxation systems for seafarers and shipping companies are vital factors in shipping operations. This means there is international competition in this area. The latest major change in the Danish economic framework conditions was the tonnage tax system in 2002. Margins on the purchase and sale of ships and pool fees are liable to ordinary company taxation in Denmark. In most of the analysed countries these incomes are under the tonnage tax system or exempted for tax.

Danish taxation for seafarers is fully competitive with the other countries.

Recruitment and education

There have been problems recruiting staff for the Danish merchant fleet for a number of years, while at the same time initiatives have been implemented to promote recruitment.

As mentioned in the introduction the Growth Strategy for Shipping – Competences and Growth from 2003 meant a restructuring of the Danish maritime education system. As a result the maritime education institutions were consolidated in fewer units and a bachelor degree for maritime officers and a business oriented master education for maritime officers were established. Furthermore the Institute for Maritime Research and Innovation at the University of Southern Denmark was founded and paved the way for commercial and scientific maritime research.

Maritime administration

The Danish Maritime Authority is part of the Danish Ministry of Economic and Business Affairs.

[33] These estimates were made by the Danish Shipowners' Association.
[34] Fairplay Information Systems.

The Authority works to create competitive conditions for the Danish merchant fleet in open and extended markets, with a high level of safety, security, health and environmental consideration. It also focuses on having and developing close cooperation with the maritime industries. Exploitation of the benefits of IT technology is a major focus area, in order to make this cooperation and working procedures as efficient as possible.

An important activity of the Danish Maritime Authority in its work with health, safety and the environment is the prevention of industrial injuries, including occupational accidents, work-related diseases and over-exertion among employees of the Danish merchant fleet. The activities of the authority aim to prevent crews from being exposed to unnecessary risks and health impacts.

The responsibilities of the Danish Maritime Authority include both compliance and policy formulation, and active participation to protect Danish interests in international forums such as the EU, IMO, ILO and WTO.

6.3 Analysis results – SWOT

The SWOT analysis in table 5 is a summary of the results from the analysis in which Denmark was compared with several other countries, and should be seen from a Danish perspective.

The review of strengths (S) and weaknesses (W) in the Danish Maritime Cluster summarises the internal conditions that form the basis of Denmark's current position. The exposition of opportunities (O) and threats (T) focuses on new factors that could have vital significance for future growth and employment.

The analysis covers both internal conditions in the maritime cluster and external conditions relating to international competition and market trends.

Table 5. Summary SWOT analysis

SWOT - strengths	**SWOT - weaknesses**
- Stable framework conditions with regular adjustments and optimisations - Very high gross earnings from shipping - The average age of the fleet is significantly less than the world average - Danish shipping enjoys a good international reputation - A number of leading international companies in shipping and equipment production - A well-qualified workforce - A good education tradition - A smoothly operating maritime authority that serves as a sector authority - A competitive taxation system for shipping - Good cooperation between shipping companies and the maritime administration	- Denmark's declining ranking in international Port State Control lists - Growth in tonnage in the Danish-owned fleet is lower than in the other countries - Limited cooperation within the Danish Maritime Cluster with regard to recruitment, education, career paths, and research, development and innovation - The education level for charterers is too low - Lack of public awareness of the good education and career opportunities in the Danish Maritime Cluster, leading to recruitment problems - Danish national requirements for shipping
SWOT - opportunities	**SWOT - threats**
- Attract more shipping companies and other maritime activities to Denmark - Increase access to growth markets in China, India and South America - Increase sales to shipbuilding industry growth markets - Increased strategic research and development activity - Further structural development in the small enterprises in the Danish Maritime Cluster - Greater government efforts to promote Danish maritime interests - Greater international focus on quality shipping	- Insufficient flow of naval architects and other skilled labour into the sector - Competition from countries with lower wages - Crew expenses on Danish ships for Danes and foreigners are higher than for comparable registers - Lack of awareness of the significance of shipping for growth and employment in Europe

The basic conclusion is that Denmark is already a leading maritime nation. But a number of initiatives can be set in motion to counter the threats and weaknesses the maritime cluster in Denmark is facing, and to exploit the opportunities the future holds.

Health, safety and the environment

These areas are central in the Danish work with quality shipping, both nationally and internationally. Having a level playing field for all parties is vital to the development of competitive international shipping.
Given that international conventions and EU regulations are increasingly supporting Danish viewpoints in relation to quality shipping, the Danish Maritime Authority's primary line has become to abolish national requirements, or to seek to incorporate these into the international conventions so that they apply to all vessels.

The Danish Maritime Authority, in cooperation with the industries, is in the process of completing a major review of the Danish regulations in the areas of health, safety and the environment.

International cooperation in relation to Port State Control is important for the work of the Danish Maritime Authority. The detentions under the various control regimes provide an important indication of whether individual flag States are fulfilling their responsibilities in relation to health, safety and the environment in a responsible manner.
Denmark is doing significantly better in relation to the Tokyo MoU than the Paris MoU. In 2005 it is expected to occupy fourth and ninth place, respectively. In relation to the Paris MoU, there has been an improvement compared to previous years, but the position is not satisfactory.
Out of the eight study countries and Denmark, only China was on the US Coast Guard's list of quality shipping nations at the beginning of 2006. Denmark lost its place on the list in 2005.

Primarily smaller, older dry-cargo vessels are detained. The problems are attributed to two causes. Firstly, some shipowners have difficulty, technically and operationally, honouring the international requirements placed on shipping today. Secondly, shipowners fail to appreciate that detentions represent not only a temporary problem for the shipping company in question (i.e. that the vessel is tied up), but also a problem for all Danish registered vessels and their ability to operate internationally with the greatest administrative ease.

The detentions have been receiving increasing attention in the Danish Maritime Authority, in part through consistent follow-up and an increased focus on information and experience exchange.

6.4 The Danish Government's action plan for growth in the Danish Maritime Cluster

The basic aim of the action plan is to help ensure that there continue to be attractive conditions for growth in the Danish Maritime Cluster in the future. This growth will not happen automatically. Globalisation and international competition are placing greater demands on shipping companies and the other enterprises in the Danish Maritime Cluster. It is essential that the framework conditions for the industry always remain attractive and are regularly adapted. It is also essential to have a maritime administration that can match the regulatory needs of the industry, both nationally and internationally. This is the only way that Denmark can retain and improve its position as an international maritime nation with quality shipping and commercial efficiency. This is necessary in order to create growth in the Danish Maritime Cluster.

As mentioned in the introduction, there are three central objectives for Danish initiatives:

- Denmark should strive to become the most attractive place in Europe to operate international quality shipping.
- Conditions for growth, dynamics and competitiveness across the entire Danish Maritime Cluster should be enhanced.
- Health, safety and environment on ships should be maintained and improved, so that Denmark develops as a leading maritime nation with an international focus and quality shipping.

Action plan

Based on these objectives, and the analysis of the framework conditions in Denmark compared with a number of other leading seafaring nations, the Danish Government has prepared an action plan which aims to improve the framework conditions for the Danish Maritime Cluster.

The action plan will realise the objectives through seven focus areas:

1. Better education and greater flow of skilled labour into the Danish Maritime Cluster.
2. Research, development and innovation in the Danish Maritime Cluster.
3. Taxation and development financing.
4. Reduced administrative burden and fewer Danish national requirements.
5. Promotion of Danish influence and market access.
6. Greater focus on quality shipping.
7. An efficient, service-oriented and modern administration.

These focus areas are discussed below.

1. Better education and greater flow of skilled labour into the Danish Maritime Cluster

The Danish Government will continually monitor the skills needs of the maritime industries, to ensure educational courses are up-to-date and correctly targeted. To increase the flow of qualified young people into the maritime industries, greater recruitment and information initiatives will be implemented regarding career opportunities and patterns in these industries.

Efforts will be made to increase the inflow of qualified maritime officers into the merchant fleet via a retraining program for navigators in the fishing fleet. In 2006, the Danish Government will also permit qualified maritime officers from EU and EEA countries to become masters on Danish ships.

Continuing training courses available to masters from smaller vessels will be reviewed and modified.

The Danish Government will initiate an analysis of the skills required by the shipping companies' onshore organisations. It will also consider the need for bachelor and diploma level courses in the area of shipping and chartering, and a technical master's degree in addition to the maritime officer courses.

2. Research, development and innovation in the Danish Maritime Cluster

Work will be initiated to establish an overall strategic, business-oriented platform for research, development and innovation in the technological area of the maritime cluster. This will take place in close cooperation with the cluster and research, pro-active knowledge-sharing and educational institutions.

As part of this process, a national research and development programme has been initiated in the area of maritime technology. The programme has been developed in cooperation with the Technical University of Denmark (DTU) and Force Technologies. The programme aims to ensure that Denmark continues to maintain advanced research in the area of maritime technology.

An entrepreneur project will be established which aims to make it easier to start and survive as a new entrepreneur in the Danish Maritime Cluster.

3. Taxation and development financing

Analyses will be initiated into the opportunities for expanding tonnage taxation to include taxation of pool fees paid to the shipping company that manages a given pool, tax on profits from the sale of tonnage-taxed vessels, and taxation on cable-laying ships. These analyses will be carried out during 2006.

The Danish Government, in cooperation with the shipping industry, will also investigate the options for development financing based on private capital for smaller

vessels. The intention is to create a better foundation for renewing the fleet of smaller vessels.

4. Reduced administrative burdens and fewer Danish national requirements

In order to support the international competitiveness of Danish shipping, a task force has been appointed in the Danish Maritime Authority, involving participation from the maritime industries. The purpose has been to review Danish national requirements and assess whether there continues to be a need for these. It has already been decided that a number of national requirements can be abolished. In the case of some national requirements, submissions will be made to international organisations proposing that these be incorporated into international conventions.

As part of the Danish Government's process of reducing administrative burdens, the Minister for Economic and Business Affairs has appointed a committee focusing on maritime administration. The committee comprises representatives from the Danish Maritime Authority, other government authorities and the maritime industries. In the short term (i.e. during 2005/2006), the goal is to achieve a reduction in administrative burden of approx. DKK 11 million. By 2010, the goal is to achieve further administrative reductions of approx. DKK 20 million.

5. Promote Danish influence and market access

Greater efforts are needed in international organisations such as IMO, ILO, WTO and the EU to promote quality shipping and open new markets. There is also a need for greater Danish focus on the largest foreign markets, such as North America and China, and the new growth markets in Asia and South America.

In collaboration with the maritime industries and the Danish Export Council under the Royal Danish Ministry of Foreign Affairs, greater efforts will be made to promote export and investment opportunities for maritime industries and attract investment to Denmark.

The Danish Maritime Authority will offer shipping companies that are not familiar with the procedures of the Danish authorities a key account manager. A "start-up kit" will be prepared for foreign shipping companies. The kit will provide rapid insight into the most important issues relating to registration in the DIS, and hence support foreign shipping companies in choosing a register.

6. Greater focus on quality shipping

Efforts to improve Denmark's position on certain Port State Control lists must be increased, as a detention is not only a problem for the shipping company in question, but for Danish shipping in general. Broad initiatives will be introduced, including extraordinary audits for shipping companies after a detention or accident, as well as seminars and conferences, etc. Master meetings will also be arranged for smaller vessels, involving participation by several shipping companies and the Danish

Maritime Authority. The aim of these will be to widely disseminate information on experiences and initiatives to achieve safe shipping operations.
To ensure greater safety in Danish territorial waters, proposals will be made to the IMO regarding bridge watch alarms and blood alcohol limits at sea.

7. An efficient, service-oriented and modern administration

The Danish Maritime Authority must be further developed as an efficient, service-oriented and modern administration with one-stop-shopping that makes it easy for shipping companies to run a business in Denmark.

There must be the option for self-service facilities and electronic solutions. During 2007, it should be possible for almost all vessel ownership registrations to be processed electronically, without using paper. The aim is to eliminate the waiting time for Danish shipowners, banks, and lawyers, who should be able to report electronically a change of ownership or a new mortgage deed, etc.

A number of further digitalisation projects will be initiated, and clients will have the choice of verbal or written information in Danish or English.

The terms of reference for the Danish Maritime Authority will be extended to cover Danish-operated ships, to support the activities of the shipping companies in this area. Assistance will cover whatever problems they might have in connection with navigation, etc., on a user pays basis. Assistance must be rendered in a way that appropriately divides the tasks with the ship's flag State and the port states.

Regular monitoring

In order to achieve the growth objectives set for the Danish Maritime Cluster, maritime activities in Denmark must increase at a faster rate than in the other European countries.

The following indicators have been put forward to measure this:

- Value Added[35]
- Export earnings
- Employment[36]
- Nationally registered fleet – total and by segments
- Average age for the Danish registered fleet – total and by segments
- Owner and operator[37] controlled fleet – in total and by segments
- Average age for the owner-controlled fleet – in total and by segments
- Changes in gross earnings from chartered ships[38]

[35] For countries where the information is available via EUROSTAT. Value Added - VA as an expression of earnings is not an unambiguous measure. Returns and depreciation for proprietary ships are defrayed by VA, while they are part of the hire charge for chartered ships, which is paid before VA. Chartered ships have accounted for a major proportion of growth in recent years.

[36] For countries where the information is available via EUROSTAT.

[37] Currently only Danish (total) figures are available for the chartered component of the fleet, according to statements prepared by the Danish Shipowners' Association.

- Danish shipowners' new construction orders
- Quality shipping – few detentions

The aim of the indicators is that they should together provide a picture of the changes in the sector. Priority has been given to analytical clarity, and to finding indicators that should be measurable and easy to use.

Denmark must have the highest percentage increase in the largest possible number of the above 10 indicators[39] in order to achieve the goal of growth in the maritime cluster. The measurements will be carried out annually.

It has not been possible to identify equivalent indicators for other industries in the maritime cluster.

[38] Currently only Danish (total) figures are available for the chartered component of the fleet, according to statements prepared by the Danish Shipowners' Association.

[39] Apart from the fleet size indicators in points 3-6, the indicators are subject to significant statistical delays.

7. The French Maritime Cluster

by Francis Vallat and Philippe Perennez[40]

7.1 The French Maritime Cluster's activities

The French Maritime Cluster consists of a large number of sectors with a substantial size as the table below illustrates[41].

Sectors of activity	**Direct Employment**	**Turn-over (billions of euros)**	**"in a few words…."**
Merchant fleet	20,000	9	100 million tons, 14 million passengers carried per year
Ports	44,000	4.5	50% of foreign trade (75% outside the EU)
Shipbuilding and marine equipment suppliers	39,000	4.7	A presence in all complex ships (passenger ships, furtive ships…)
Oil and gas Offshore equipment and services	25,800	6	Exploitation of hydrocarbons up to 2000 meters ocean deep
Yachting and leisure boats industry	50,000	3	93,000 sail boats produced in 2003
Fishing and sea products	55,000	5.5	5,600 ships (8000 with overseas territories (DOM))/ 80,000 tons
Governmental activities at sea	60,000	6.1	From sea rescue to aircraft carriers (navy)
Research Institutes	4,000	0.6	From poles to ultra deep sea
Training agencies	6,000	0.6	Get the men ready….
Other activities	9,500	1.8	The support of other branches!
Total	**315,000**	**36**	

[40] Francis Vallat is chairman and Philippe Perennez is director of the French Maritime Cluster organisation: Cluster Maritime Français

[41] Figures quoted are a mixture of last year's publication and this year's available information. We are in the process of updating all data, which should be finalized by autumn 2006.

Some qualitative remarks on these figures:

- The cluster of maritime industries employs about 1.5% of the French labor force while the production, excluding the intermediary purchases within the cluster, amounts to between 2 and 2.5% of the gross domestic product.
- These figures are estimates, given the fact that accurate statistical information is hard to get and the definition of the boundaries between what is "maritime" and what is not, is difficult. Nevertheless, this table only includes the jobs depending almost exclusively on the sea. Hence, littoral tourism activities which amount to 20 billion euros and 200,000 jobs, has not been included into the cluster. In the same way, port activities do not take into consideration indirect jobs like those in industrial port areas or jobs in transport related activities. The jobs related to all the port activities amount to about 300,000. In that case the total contribution of the maritime cluster would increase from 5 to 10% of the GDP.
- Yet, even in restricting ourselves to the maritime cluster in the narrow sense, it is important to note that about half of its production is exported. In money terms it is at the same level as the exports of the French car industry or the aeronautical industry and at three times the level of exports of the famous French wine industry.

7.2 France: A Maritime Nation

France is a true maritime nation. Its advantages are based on the remarkable natural assets and a great diversity of resources. With 5.000 kilometers-long coast, to which must be added the 1, 500 kilometers of French overseas territories, France has a significant coast line with a huge number of 564 ports (commercial, fishing or recreational harbors). The coastal zones are both fragile and coveted because numerous economic activities such as international trade, yachting industry, fishing and tourism are linked to them. It is then vital to protect the littoral and at the same time develop its potential further.

This privileged geographical situation is reinforced by a large exclusive economic zone (EEZ) of 955.000 square kilometers which grants France various maritime advantages.

In terms of economy, the country's assets reside mainly in the diversity of its industries and of its competitive services. The net value added of economic activities in the maritime cluster is actually more significant than many people think. We must bear in mind that it represents a value added of €19 billion which corresponds to more than 500,000 jobs (direct and indirect), a number that has been increasing over the past few years.

Moreover, maritime transport plays also a major role for the country in foreign trade. The value of the French exports and exports of goods is very high, as it ranks at the fifth and sixth place respectively in the world. Its foreign trade is close to, if not over 650 billion euros, which represents 480 million tons of goods, including all modes of transport. This represents 12 % of the total exports of the European Union. About

half of this tonnage is shipped by sea. Therefore France has a very important maritime economic activity which has been grown steadily over the past years, taking advantage of the opportunities in the global markets, in particular in the offshore, shipping and shipbuilding sectors.

France can pride itself of having a high proficiency in world competitiveness in activities with an important value added. It is ranked among world powers in about ten essential maritime professions.

French shipping owns only about 210 ships flying the French flag and controls less than a hundred ships flying a non national flag. If also the fleet of service vessels, specialized vessels and also units of less than 100GT are considered, the total would be more than 6.700 units. French shipowners employ 10,000 sailors and have at their disposal ships of all types and sizes which serve all geographical areas of the world. French shipping is present in all the sectors: dry bulk, liquid bulk, liner service, conventional and specialized transport. It is also among the first ferry operators and among the world leaders in maritime research and technological services. Another asset of French shipping is its tanker fleet which stands among the youngest of the European Union.

7.3 Several World Leading Actors

The CMA-CGM group illustrates the French skills in container shipping as it is the third largest company in the world. CMA-CGM controls a fleet of over 250 ships, it currently has around 50 ships on order (expected between 2006-2009) and is operating more than 80 liner services serving 350 ports, therefore offering its clients an exceptional geographical coverage.

Another important shipping company is Louis-Dreyfus Armement which is a key player in industrial chartering as it is the second largest dry bulk chartering company in the world with 1800 charter fixtures per year. LDA can also rely on the strength and quality of its industrial fleet (about 60 vessels) which offers a large range of maritime services in niche markets like telecom, seismic, and Airbus Industry.

The French shipbuilding and ship repairing industry with close to 40,000 direct jobs and a production value of 5 billions euros on average, takes a sixth place on a global ranking. Its success is due to the quality of the human resources, to innovation capacities (notably in the naval/ship industry) and to commercial efficiency. France is specialized in sophisticated vessels, cruise and passenger ships, gas carriers, megayachts, and frigates. Aker Yards France has a world co-leadership for the building of cruise ships, with a global market share reaching up to 25% (for instance in 2001-2003). The delivery of the largest cruise ship in the world (in 2003), Queen Mary 2, is one of its greatest achievements. Les Constructions Mécaniques de Normandie (CMN), which build sailing boats as well as catamarans or single-hulled vessels, with aluminum or epoxy carbon hulls, and more standard monoyachts or medium units in steel, are very efficient in the manufacturing of super yachts. Finally, DCN remains the first European builder of naval ships. In 2005 the Defense Naval Group realized an increase in its operating result of 18.6%. A naval integrator,

DCN runs the whole chain of the naval system of a defense contractor: from engineering and conception to the maintenance in operational condition. Therefore France presents numerous competences in high-tech shipbuilding.

Concerning offshore oil and gas, the French industry is increasing its efficiency and extending its service levels. TOTAL, in fifth position on the global market, plays a fundamental international role as well as Gaz de France that has now become a competitive player on the international scene.
With TECHNIP, France possesses a world champion in engineering. TECHNIP is the world number one in subsea oil and gas supply and services. TECHNIP ranks among the top five world groups in engineering and construction, in the fields of hydrocarbons and petrochemical industry. Doris Engineering is also acknowledged as the world leader in services for oil and gas offshore operators.
Finally, Bourbon remains a reference in terms of oil offshore maritime services. It aims mainly at satisfying the growing needs of its clients for deep water oil production and exploitation. The group is mainly active in the Golden triangle strategic area (Western Africa, Mexico, Brazil and the North Sea) and works for the leading international oil companies and for state corporations like Petrobras. Its 2,500 employees, its international presence, a fleet of 130 modern offshore new generation ships and more than 100 ships on order, an advanced technology and a large financial capacity, have created a real leading position for the group.

The innovative yachting industry became world leading over the past ten years which is also reflected in the high level of exports of 62% of the sales since 2004. French companies are leading manufacturer's of sailing boats and inflatables, and the second producer of motoryachts. France can be proud of its achievements in the yachting industry, an industry which employs about 50,000 people. There are today 4 millions "yachtsmen" in France and sailing boat registrations increase by 20,000 units per year. There are almost 370 marinas on the French coastline, a number which is still insufficient given demand of anchorage, which offer more than 165,000 berths to which must be added individual and collective anchorages along the coast. Bénéteau is today an undeniable world leader in sailing boat building, but the yachting industry is also represented by the marine division of Zodiac which holds the first world position for inflatable and semi-rigid boats.

The naval force of the French Navy contributes a dissuasion and action capacity at the service of Europe. Present everyday on every sea of world, the Navy has permanently 35 vessels at sea, including an aircraft carrier, as well as a patrolling nuclear and missile launcher submarine, and 12 airborne aircrafts. The French Navy was made very flexible, as much at home as on its overseas territories, to accomplish its missions. For example, the helicopter-carrier Jeanne d'Arc was re-routed at the beginning of 2005 to give assistance to the victims of the tsunami in Indonesia. The marines-commandos carry out protecting missions and are able to accomplish powerful actions at sea or on land. With its air and sea as well as amphibious groups, its nuclear-powered attack submarines and its frigates, France is the only country, behind the US, to have a real capacity of combined force interventions.

Heir of four centuries of sea knowledge and know-how, France currently has become one of the world leaders in marine research and ocean science. Research is internationalizing itself in all the disciplines. In deep sea exploration, France has been a pioneer for twenty years. Only three submarines like the Nautile, Ifremer's submersible which goes down to 6000 meters deep, exist in the world. It is, for a major part because of this that the French undersea geological research has enabled the understanding of the plate tectonics, the continental drift and certain seismic phenomena. The study of the deep sea allows also the discovering of new species that can live down to 4,000 to 5,000 meters deep. France shares with the US the technological advantage on oceans observation thanks to a temperature and salinity measuring system coupled with satellite-based information. Another focus of interest in which France excels is in coastal oceanography as well as in marine ecology and the environment quality monitoring, which constitute also a field in which French research stands out, with topics like the study of the impact of climatic changes and the pollutants on the ecosystem and on men. Ocean research is carried out by numerous specialized institutes, including the undeniable French pride: Ifremer that owns sixteen oceanographic ships, three deep water submarines and an inhabited submersible.

Moreover, the French stand on the world podium in the maritime insurance sector. The French maritime insurance companies are actually maintaining themselves at the 2nd or 3rd world ranking, excluding captive markets (i.e. ranking fifth if the markets not really open to foreign competition like the US and Japan are taken into account). Their activities largely surpass the home market, and concern almost a quarter of the tonnage of the merchant fleet operating worldwide. This leadership position results mainly from the market organization, from its reliability, its securities, its tools, its methods, the existence of technical agencies and various associations forming part of its environment, in one word: its quality. A major asset of the French market resides in its experts' network, managed by the CESAM. The future outlook seems favorable for growth in the insurance market. Axa Corporate Solutions and Groupama Transport are the two notable French groups of the sector, while a few well reputed independent brokerage firms are also quite active both at home and internationally.

Besides, France is imposing itself in ship financing. In a decade, Calyon, BNP Paribas and Société Générale have been able to reach the level of the biggest international banks specialized in shipping. Others are also very active like the Caisses d'Epargne, Natexis- Banque Populaire or CIC. They all have developed tools to accompany the world fleet's renewal and growth. Calyon stands as a reference as a bank specialized in maritime financing with a ship financing share of 4% on the global market and a direct financing portfolio of 7.5 billion dollars in 2004 for 1000 ships (far higher when including indirect operations). Calyon is active for all types of ships. As to BNP-Paribas it corresponds to a team of 40 professionals mainly focused on Asia and on methane tankers, and to a direct portfolio that reaches the amount of at least 3 billion dollars.
Société Générale and Natexis-Banque Populaire are two globalized actors characterized by a large credit capacity, for instance, Société Générale provided

nearly 250 million euros for loans in 2002, placing it in a good world position from then on.
In the domain of maritime chartering and ship brokerage, France has celebrated this year the 150th anniversary of Barry Rogliano Salles (BRS), which ranks in the top five of the world's shipbrokers, and probably on a third place when all activities are included. With BRS, France has one of the leading brokers in the newbuilding sector. BRS brings to its clients a large range of services: research and analysis of the markets, market opportunities, organization of calls for tenders, supply analysis, ships evaluation, fleet analysis. The number of international BRS clients illustrates the international nature of its activity. The latter is also reflected in the significant positions hold by a few other independent brokers which are less important in terms of business volumes.

Finally, France is prominent in classification. The marine division of Bureau Veritas ranks at the 2nd place in the world in terms of the number of ships and at the 5th place in terms of tonnage. The group has a world-wide workforce of 25,000 professionals spread over 600 offices and labs in 140 different countries. The international ship classification society provides the maritime sector with a large range of services: classification, certification, information services and system, assisting and advisory services.

It is also very important to mention the French ports, which role in the French maritime economy is growing by the day. The ports employ about directly 40,000 people and handle with nearly 370 millions of tons of cargo of which half are liquid bulks (essentially oil), a quarter are dry bulks (cereals, coal, ores)and another quarter are various cargos of which an increasing part is containerized. On average, a merchant ship is berthing a French port every six minutes!

French ports have a strategic geographical position for receiving the production and distribution of goods for Europe. In the Channel-North Sea range, Le Havre and Dunkirk are the first large European ports for imports. On the Atlantic coast, the ports of Bordeaux, Nantes - Saint-Nazaire and La Rochelle constitute open doors for the great international flows towards Eastern, Northern and Southern Europe. On the Mediterranean Sea, the port of Marseille-Fos, first port of France and of the Mediterranean and an "open door" to Southern Europe, is located at an important commercial crossroad. This maritime infrastructure is completed by the French overseas territories ports in the Indian Ocean and the Caribbean Sea, thus forming as many open doors into the E.U.
French ports are, in general, accessible to all ships because to their permissible deep water draughts deep, adapted to each type of traffic. Most ports are linked to the fluvial network, therefore allowing the shortening of pre and post shipment.
The large French ports have implemented a reinforced safety system through the realization of protected enclosures, computer assisted controls of container moves, and access controls to port areas which improve the ports' efficiency and safety while allowing costs reductions.
Eventually, to respond to the market needs and to technological evolution, French ports are carrying out a policy of equipment modernization; examples of that effort are Port 2000 in Le Havre and Fos 2XL in Marseille.

The French maritime assets referred to in the previous points represent an important potential of economic growth and employment that needs to be highlighted, and that is one of the missions set up by the French Maritime Cluster organisation. .

7.4 The "French Maritime Cluster's" organization: Background, Management and Objectives

The French Maritime Cluster was founded on March 1st 2006. It is an organization that aims at presenting "the French maritime talents" and at fighting for - with the strength that represent the 120 federations and companies that have already joined it - the promotion of quality maritime activities before the political and economic decision makers from all levels and professions, nationally as well as internationally.

The French Maritime Cluster emerged from the French Institute of the Sea's (IFM) and only exists to contribute to highlighting and reinforcing the presence (more efficient, more "profitable" in terms of image, activity, and therefore in terms of turnover and results) of the French maritime professionals.

It is also in keeping with, in a quasi ideal way, in terms of schedule as much as philosophy, the spirit and dynamics which the Green Paper (on and for an integrated maritime European policy) intends to promote.

Moreover, it plays a fundamental role when it comes to taking initiatives aiming at bringing into play the solidarity between the merchant national maritime actors, just as our neighbors from Northern and Southern Europe have been doing it so naturally for years.

If through its efforts the French Maritime Cluster succeeds in encouraging, without any complex, the development at home as well as wide-ranging exports of the "French maritime talents", it does it and will be doing it first, not only thanks to the faith and to the powerful help of all those who joined and reflect the "acting diversity" of the maritime private sector, the one that wants to "make the guiding principles move", but also thanks to the exceptional support of the French Navy (the only administration member of the French Maritime Cluster). Indeed the Navy is determined to put its prestige and the calls of its vessels abroad at the service of the maritime talents' presentation made by the French Maritime Cluster.

7.5 Action and philosophy of the organization " the French Maritime Cluster"

Not long ago the French Maritime Cluster presented its action plan, set up around three major themes:

- Lobbying, in the noble and pure meaning of the word.
- Active and interactive communication, external and internal.
- And last but not least, the systematic and voluntary examination of the identification and the possibility to set up concrete and mobilizing synergies between different French maritime sub-sectors or actors, an effort which has never been achieved in France sofar. To date about fifteen synergy reflection and action

groups have been created, resulting from about 80 meetings with the French maritime executives from March to the end of June 2006.

Actually the spirit and will of the French Maritime Cluster are to develop a system of mutual assistance that will allow each party to contribute to the reinforcement of the totality of "Maritime France", benefiting everyone in return. And to launch and maintain this virtuous circle the French Maritime Cluster will be present in Paris, Brussels or anywhere else; wherever it would have a real value added.

No doubt that at the dawn of globalization, the fact of uniting ourselves, or at least of reuniting ourselves, of bringing into play the assets that we can have together in each community of which we are a member (maritime community, national community) can be a positive thing. What really matters is that it is neither about gathering "lame ducks" nor about having compatriots contemplating each other's belly button.

Besides, our community, as we have seen it, has leading actors (ten maritime professions in which France stands in the leading ranks, that is to say at least in the "top five" world leaders). This proves that our country can win in other fields of the sector as well, even if it is too often hidden by the quantitative aspect of an obviously insufficient merchant fleet, but which is one of the youngest and safest in the world. It confirms also that the national maritime community is more important than what we think, but has to carry more weight, abroad and in France, with its 315, 000 direct jobs and its 36 billion euros turnover. We can say in that respect that the French Maritime Cluster as a structured organization offers it extra credibility at the dawn of a century which appears to be the one of never ending economic struggles!

7.6 Action Plan and Cooperation

The basis, absolutely necessary to efficiency, is that the French Maritime Cluster is, or must become, among other things, the tool allowing the knowledge and the readability of the dimension and assets of "merchant" maritime France.

From this basis the French Maritime Cluster intervenes, as a lobbying organization and with the support of the members who wish to, on specific issues either before political authorities or before the decision-making centres with an influence over the French Maritime Cluster's activity or before such and such member.

The French Maritime Cluster carries out as well lobbying and communication actions on transversal, or peculiar subjects in order to highlight the achievements made by its members or in general manner to promote their activities or defend their positions, including when those ones are unfairly attacked by the media or others.

7.7 Several achievements already made

Since its creation the French Maritime Cluster has been intervening on many occasions at the request of and/or to the benefits of its members. Doing so, it has been able to notice that, concerning lobbying, the French Maritime Cluster was already a success through its simple being in its own right.

Among the interventions that it carried out, can be quoted higgledy-piggledy: the creation of innovative contacts between the members, the possibility of achieving an original idea concerning the merchant sector which might be concerned by the issue on ship demolition, the role played by the French Maritime Cluster for the presidency and vice presidency; currently assumed by the private sector, of BF2S (Bureau Français de Cabotage - *French Bureau of Short Sea Shipping*), the emphasizing of the relationship between the French Navy and certain members, varied and concretized lobbying initiatives; proactive support actions of initiatives at the same time professional, commercial and societal (Ship Waste /Imra), and even transversal public interventions interesting indirectly all members of the French Maritime Cluster (Waterborne Technology Platform, etc.).

Besides, the French Maritime Cluster has already launched or participated in the to coordination actions, and has led a collective reflection allowing it to suggest an action plan covering the time period from mid 2006 to the end of 2007.

7.8 Examples of several actions currently in progress

- At the occasion of the EuroNaval international exhibition, the CMF will be presenting the different maritime sectors with their strong points, theirs pioneering initiatives and their assets.
- Given the past success of the "French Maritime Cluster's" booklets it's been decided that the French Maritime Cluster would supervise the reediting of a new leaflet more complete, in order to present the cluster and therefore its maritime economic and social impact in France. This brochure will conciliate the presentation on the one hand of the "French maritime cluster" in its broader sense (in general as a national sector), and on the other hand of the French Maritime Cluster as an organization, as well as of its members etc.
- NB: It may be important to notice the cluster will not include the inland shipping in its perimeter, but may include the so-called "fluvio-maritime". On the other hand it will take into account the new regional "Pôles de compétitivité maritimes".
- The French Maritime Cluster is currently elaborating a "communication kit" for/with the French Navy in order to promote the French maritime strong points. Moreover, it is going to conceive fixed presentation panels as well as powerpoint presentations on the French Maritime Cluster which will be at the disposal of commanders of military vessels to display them during the on board receptions abroad. The French warships make about 350 calls abroad or in France per year, of which about a hundred could be used to the promotion of the French Maritime Cluster and its members (from frigates to aircraft-carriers). The possibilities for the French Maritime Cluster members will go from the simple and pure presentation of the Kit and fixed panels to a much more active participation (invitations of the clients or prospects on board, in addition to the ones done via the Naval attaché or the Embassy, for an "interactive" reception, the possibility of sending representatives from France by the French Maritime Cluster members to answer the questions and so on.

- Besides, a directory in French and in English will be presenting the members of the French Maritime Cluster, with one page per member (whatever the size or the economic importance). The information will be presented in a standardized way, the same directives and the same formal framework applying to all members, therefore facilitating a quick reading and an efficient use.
- A website will be created as soon as the French Maritime Cluster is ready to accomplish it in the conditions assuring its interest and an irreproachable quality in all perspectives.
- A strong networking action is going to be set up, it will comprehend a "buffet/open table", at the headquarters and at the expense of the French Maritime Cluster, once per month (for instance every first Wednesday of the month). The purpose of it being to pursue the reflection on synergies, encourage the cluster's transversal side, and allow friendly meetings between the members that wish to do so ("Professionals to socialize!").
- The French Maritime Cluster will also act as an "engaged observer" of the press. In the French maritime business promotion context, the French Maritime Cluster puts itself at the disposal of its members if they wish for a public intervention on a specific subject. This action aims at giving rise to more professional behavior, notably on behalf of the journalists, in the maritime world, through strong interventions in case of wrong, incomplete or biased articles. The French Maritime Cluster proposes realizing interventions and/or press releases and defending maritime, including individual, interests, in the media.
- Information sheets showing the members useful ways for the development of their activities will be edited, each one of these sheets presenting a particular topic. For example, a sheet will be made in collaboration with the Foreign Affairs Ministry, to present the possibilities of help for offices abroad and for certain export modalities. Sheets on the Waterborne TP, UBIFrance services, and FCI are being studied as well, and will be put at the exclusive disposal of the French Maritime Cluster members.
- The French Maritime Cluster will put forward the signing of conventions (between its members agreeing to it) in order to give each one of them the opportunity to put on its website a link to the French Maritime Cluster site and to other adherents. In that prospective, the French Maritime Cluster will be editing alone the conventions and will suggest them to the member companies (which will also mention their adhesion to the French Maritime Cluster in their clients' commercial tools).
- Like the example of U.K.'s "Sea Vision" campaign the French Maritime Cluster will allow under conditions, but quasi systematically, for the uncontestable maritime manifestations, the events organizers to take up the French Maritime Cluster logo onto the advertising brochure. In exchange, the French Maritime Cluster will communicate, to its members and the adequate targets, on the existence of the maritime events.
- The French Maritime Cluster will also be acting to have its members participate to the business delegations which accompany the President of the French Republic or the Ministers on official foreign visits.

- A better information on the European maritime sector, and its adapted version for each country is necessary for the communication and media coverage of the significance of the maritime cluster and the practice of lobbying before the European Commission as much as at a national level. In collaboration with the European Network of Maritime Clusters, initiatives are undertaken to obtain from the European Union the necessary support for the gathering of information related to the maritime economy in Europe, going through the definition and analysis of each national maritime cluster.
- Visits of the European Commissioners' offices, concerning transports, environment and maritime affairs, are planned for the coming months, as well as meetings with certain members of the European Parliament. The French Maritime Cluster members are and will be invited (through a previous note) to tell the French Maritime Cluster if on these occasions they wish the stress certain issues.
- In respect of the suggestion of several of its members, the CMF may serve as a neutral space for meetings between the actors (members of the French Maritime Cluster or not) who wish to debate on common interest issues that can't be discussed in more specialized, formal or too media-covered places. Some examples are already in process.
- The French Maritime Cluster will be keeping up to date, with the help of its members and of the European Network of Maritime Clusters, a calendar of the major maritime events, meetings, conferences, exhibitions and other maritime activities, in France, in Europe and in the world. It will also be able to try to insure - for instance via its members already involved as private individuals - a French presence at each one of these major events, either as an intervening party or as an active participant (both for itself and as representing the French Maritime Cluster).

7.9 The French Maritime Cluster seen by non-members

It is noteworthy to mention that at least twice, we have been asked to present the concept of French Maritime Cluster to foreign authorities (once by the Portuguese Minister in charge of Defence and Maritime affairs (in June) and the other, by the Luxembourg (in July)).

A Particularly Original Initiative: The "Synergy" Working Groups

The very definition of « cluster » induces the reunion of actors coordinating themselves to carry out converging actions to increase their performances, actions which they wouldn't have carried out on their own. In that respect, the French Maritime Cluster suggested convergence goals to its members, in the hope that their implementation would contribute to the valorization of the French maritime place. To do so, it has, after numerous interviews with executives of the French maritime world to listen to their suggestions, proposed the constitution of very concrete "synergy" working groups, on the most debated issues. During each group meeting the participants will have to decide freely whether to keep or reject the theme selected by the persons in charge in the French Maritime Cluster, as being susceptible of representing a positive guideline of reflection/action. If the theme is confirmed, it

will then be worked on during the meetings, to end up with a new product or a new service.

The themes that ended up selected concern the following topics, bearing in mind that it is about searching new ACTIONS, and not about doing bright intellectual studies:

- French Navy/ Merchant Navy Cooperation, in particular and as far as logistics are concerned.
- Ship demolition, an approach of industrial actors.
- Is a private Maritime Investment Fund to be created?
- The maritime industry and its image: best common valorisation of the efforts made by each member of the French Maritime Cluster, in particular in terms of innovation and environment.
- Revalorisation of the French fishing assets.
- Advantages and feasibility of personnel exchanges, including navigating staff, between sub-sectors.
- Prevention: a better coordination of insurer experts, class etc…could it be a plus?
- A common approach of the French maritime "conservative" blockages (employers', union, corporatist ones)
- A better knowledge and promotion of the French assets or of the place of Paris (juridical professions, Maritime Arbitral Chamber etc)
- Is a deep reform of the maritime training Schools to be considered? (What about creating a private Naval Academy?)
- Possibilities of practical collaborations between big groups and small and medium-sized businesses, concerning in particular the influence and action networks abroad (geographical or functional reciprocal assistances)
- Possibility or not of packaged products in certain fields (for instance shipbuilding, insurances, financing etc…).
- Usefulness of a National Week on employment and on maritime training
- A better approach (internal and external) of the national ports' efficiency
- Advantages of the maritime activity to put into view before the defects often put forward by the financiers.

8. The United Kingdom's Maritime Cluster

***by Mark Brownrigg*[42]**

8.1 Introduction

The UK's maritime cluster has existed for decades, maybe centuries – often in the form of common ownership of businesses across different maritime sectors and of mutual business interests. However, until recently, the different sectors tended to work in isolation in policy and political matters. Building, through the first part of the 20th Century, on the strengths of the UK merchant shipping fleet and on the shipbuilding industry, the UK's maritime industries prospered until the early 1970s, following which they entered a downward trend. This was caused by the move of much of maritime manufacturing to the Far East, by the shaking-out of old-fashioned attitudes spurred on initially by the after-shock of the first OPEC oil price rises in 1973, and then by the long and sometimes painful adjustments necessary to bring a very traditional sector into line with the requirements of the modern world and the new imperatives of globalisation.

Part of that process involved the emergence during the 1990s of stronger bilateral relationships involving different parts of the maritime sector (shipping with ports; shipping with shipbuilding and marine equipment; the maritime legal and financial services of the City of London; etc). It was not, however, until the early years of the 21st Century that a more multi-lateral approach began to emerge within the UK maritime cluster, which recognised the value of the different sub-sectors working together to achieve new and practical objectives. This is still in evolution and the dynamic is both deepening and spreading.

Although much reduced by the late 1990s, the UK maritime sector was still assessed by a report commissioned by the European Commission[43] to have the maritime cluster in the European Union with the highest direct value added – built essentially around the still substantial influence of the UK-based merchant fleet, and strong showings by the marine equipment, maritime financial and legal services, and off-shore sectors, albeit noting that others (eg shipbuilding and fishing) had fallen away.

The current UK approach to cluster activity in the maritime sector is multi-tiered, operating at national, regional and sub-regional or local level, and also sectorally. It is built very much on continuing dynamic activity by a wide range of organisations across a very diverse maritime economy.

This diversity is regarded as valuable and as strengthening the maritime fabric of the UK. It builds on a strong tradition of active trade and professional associations in the

[42] Mark Brownrigg is Director General of the UK Chamber of Shipping
[43] Economic Impact of Maritime Industries in Europe, by Policy Research Corporation and Institute of Shipping Economics and Logistics (2001)

maritime field and offers an opportunity to involve all relevant parties – companies, organisations and collective groupings, as well as individuals.
The challenge in recent years – as now – is how to bring all of these energies together in an optimal way.

Different constituents within the cluster clearly have different motivations for wishing to work together. Of these, three stand out in particular:

- Profile and image of maritime activities (which includes careers promotion)
- Commercial structural and promotional activity
- Political influence.

Individual trade associations in the different sectors have – in view of their maturity in the UK – all three motivations, in differing degrees.

8.2 Profile and Image

This is the first and most developed cluster activity in the UK and is co-ordinated by **Sea Vision UK**. This initiative adopts a very broad definition of the "maritime cluster" including not just the conventional commercial cluster but all activities which have a practical relation with the sea.

It spans partners involved in environmental activity, heritage/arts/leisure, marine manufacturing, shipping and maritime services, the Royal Navy and related activity, regional and local organisations, training/careers/education, and professional institutes and voluntary organisations. The principal sponsors currently are Lloyd's Register, the Royal Navy and the Chamber of Shipping.

Aims and messages

The focus of the Sea Vision UK campaign is deliberately limited to two areas:

- raising awareness and understanding of the sea and the value of the maritime activities which work with it to the UK's economy and society; and, through that,
- seeking to capture the imagination of young people, both because they are the future populus which is needed to sustain that awareness into the future and because the cluster needs their involvement and their enthusiasm, if they are to be attracted to careers in one or other maritime occupation.

The objective of all Sea Vision partners is to work together to make ships and maritime activities "visible" to the public once more. The campaign aims to confront the disconnect which exists in the public's often negative perception of the different parts of the maritime sector with the reality of the contribution that they make to the world's fifth largest trading nation, 95% of whose trade moves by sea. The reality – far from being driven by impressions of pollution, sunset industries, and inefficiency – is that the UK's shipping, ports, manufacturing and services sectors are modern businesses, well suited to and well placed in the global economy, and generators of an internationally respected professional skills base.

The Sea Vision messages are that:

- The **seas** are important to the United Kingdom for the resources they provide, the environment, trade and industrial activity, science and technology, and leisure enjoyment.
- The UK's **maritime activities** – including particularly the commercial sector – are essential to the quality of life of UK citizens (eg safeguarding in a sustainable way the variety and choice of goods available to consumers in supermarkets and on the high street; safeguarding the energy supplies which underpin our society; and providing a variety of healthy leisure activities). They are also a major contributor to the UK economy and involve high-level technology which is admired through the world.
- The **career opportunities** in the maritime sector (in its widest sense) are varied and challenging and offer high-quality, transferable skills.

Defining and quantifying the cluster

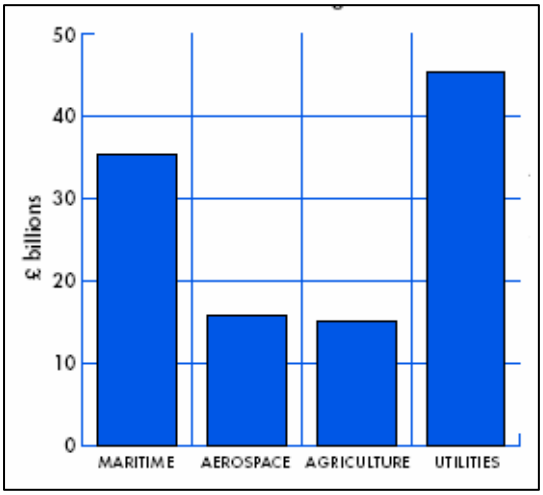
Using existing available desktop research[44], in 2002 Sea Vision UK brought together all the known analysts of the cluster and developed – for the first time and by consensus – a universally agreed definition and quantification of the sector for the years 1999/2000. This is shown on the next pages.
It identified the sector's turnover at that time as £37 billion (€55 billion). Then, this was more than aerospace and agriculture combined. Since that time, it is clear that, partly as a result of exceptional markets but also of a change of Government policy which brought the UK's shipping taxation regime into line with other regimes in the EEA (through the adoption of the tonnage tax), there has been a substantial expansion of the economic contribution of at least one of the major sectors – shipping – and the overall earnings are now well over £42 billion (€60 billion).
The analysis also identified 250,000 direct jobs in the UK's maritime sector (as defined) and assessed that there were a similar number employed indirectly as a result of maritime sector activity. These figures were thought to be conservative estimates. They showed nonetheless that the maritime sector employed the same numbers as aerospace and utilities put together.

[44] These included:

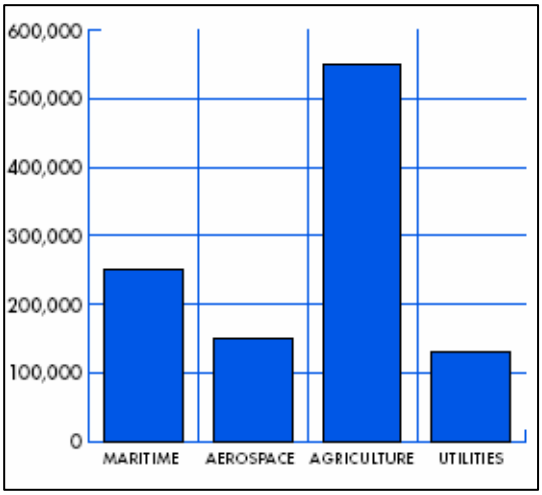
- A new analysis of marine-related activities in the UK economy with supporting science and technology, IACMST Information Document No.10 – Pugh & Skinner;
- UK Marine Industries World Export Market Potential, a report for the Foresight Marine Panel – Douglas-Westwood Associates;
- Maritime Services – International Financial Services London;
- Various industry and other representative bodies involved in Sea Vision UK

Definitions	
Oil & Gas	Maritime services utilised in the exploration, development and exploitation of offshore oil and gas fields.
Shipping	Shipping services utilised in the carriage of goods and passengers and the chartering of vessels.
Shipbuilding	Construction and repair of commercial (non-leisure) and naval ships and other marine structures.
Maritime Services	Maritime-related business services provided by the 'City'.
Ports	Loading, unloading and other handling of marine cargoes.
Defence/Naval	Military and civilian operations of the Royal Navy including foreign ship sales.
Leisure Marine	All leisure activities including boat building and equipment provision excluded above.
Telecommunications	The manufacture, surveying and laying of submarine telecommunication cables.
Research & development	University, public sector and industry involvement in maritime R&D.
New Technologies	Include underwater unmanned vehicles, marine biotechnology and marine software
Education & training	Marine courses in the higher education sector and seafarer/offshore industry based training.
Ocean Survey	Ocean surveys primarily for hydrographic and extractive industry purposes.
Safety & salvage	Public and private sector activities related to maritime safety and salvage.
Minerals & aggregates	Shipping services utilised in the offshore extraction of minerals and aggregates (other than employment this is all covered in shipping above).
Fisheries	Sea finfish and shellfish landings and fish farming activities.

Turnover
Comparison of the maritime sector with other leading sectors



Employment
Comparison of the maritime sector with other leading sectors



Industry	Turnover (£bn)	Employment
Oil & Gas	**9.20**	**25,000**
Shipping	**5.12**	**31,500**
Manufacturing	**5.20**	**40,600**
Shipbuilding	*2.54*	*24,000*
Marine Equipment	*2.66*	*16,600*
Maritime Services	**4.54**	**13,800**
Ports	**1.69**	**25,000**
Defence/Naval	**6.66**	**61,500**
Leisure Marine	**1.61**	**26,378**
Other	**2.82**	**30,460**
Telecommunications	*0.50*	
Research & Development.	*0.61*	*8,040*
New Technologies	*0.23*	
Education & Training	*0.14*	*1,100*
Ocean Survey	*0.10*	
Safety & Salvage	*0.32*	*4,200*
Minerals & Aggregates	*N/A*	*2,000*
Fisheries	*0.92*	*15,120*
TOTAL	**36.84**	**254,238**

Sector comparisons	Turnover (£bn)	Employment
MARITIME	37.0	250,000
AEROSPACE	18.5	150,000
AGRICULTURE	15.0	550,000
UTILITIES	46.0	135,000

These statistics clearly need to be updated and Sea Vision and its constituents are embarked on an exercise to produce more current figures. However, the issue of data is complex and the clear need has been identified to establish a system whereby the cluster can be quantified on a consistent and reliable basis well into the future. This requires linking national and local intelligence in a way which is mutually compatible. It is also important that any template which is developed for individual regions and sectors to assess the economic and social value of their maritime activity is worked out also in the European context. This will allow wider comparisons to be developed in future.

Currently, figures are collected at different levels by different groupings for different purposes. Thus individual national trade associations know about their own sub-sectors. Tiers of regional government (the Regional Development Agencies in the nine English regions and the administrations of the three devolved nations of Scotland, Wales and Northern Ireland) have also dabbled in regional cluster analysis. At present, all work in isolation.

There is a need to pull all of these efforts together nationally. One of Sea Vision's objectives is to help establish a common, practical, universally agreed template.

Action

To date, a key element of the Sea Vision strategy has been to use participation in public and trade events both to deliver its messages and to involve Sea Vision partners actively. These events have focussed both on the general profile of maritime activities and on education and skills. Thus Sea Vision has generated a high-profile maritime presence at family events such as the bi-annual International Festival of the Sea, national boat shows, and the UK national motor show. It has also been present at numerous regional and local events such as maritime festivals, gatherings of tall ships, and local boat shows. In careers, it has had a high-level presence at the national skills exhibition (Skill City) and has stimulated numerous joint "maritime zones" at local and national careers shows; it has organised events with careers´ advisers and supported schools' challenges involving engineering and design competitions for teenagers of a very practical nature. In these, Sea Vision works alongside young engineers' associations, education specialists, etc.
In support of all of these activities, Sea Vision UK acts as a communication hub for its partners, with whom it communicates through a regular newsletter and through a dynamic website (which includes a searchable events diary and an education and careers resources catalogue), and through the provision of publications and an extensive range of branded promotional merchandise for loan or purchase.

Currently, Sea Vision UK has teamed up with the nation's leading photographic magazine to run a photographic competition with several categories (coasts, ships, ports and harbours, maritime sporting activity, fisheries and fishing underwater). The winners will be announced and exhibited at a national holiday and travel show. This is seen as an ideal opportunity to take the "maritime message" to a very diverse and non-maritime public in a way which can also be promoted – not just by the photographic magazine itself, but by all Sea Vision partners. It will lead in due course to the establishment of photographic exhibitions which can be used by museums and other suitable venues so that the visual maritime message can continue to be promoted long into the future. If it is successful, it is hoped that this will become an annual event.

8.3 Commercial Promotional Activity

The commercial imperatives of the UK maritime cluster also find their expression in differing ways and at differing levels. Generally, these tend to be either at regional or local – rather than national – level and, as a result, many such initiatives attract Government and sometimes EU funding.

Perhaps the most prominent examples of commercial clusters are:

- Maritime London
- Marine South West
- Mersey Maritime
- Marine South East.

Other groupings exist, including at local sub-regional level (eg Maritime Plymouth and Chichester Maritime); and others are emerging constantly.

Maritime London

Founded in 2000, Maritime London was established with the support and assistance of the Corporation of the City of London to maintain and enhance London's position as the world's premier maritime centre; promote the maritime services sector; and attract new maritime-related business to London and the UK.

Maritime London is now the globally recognised brand name for the unparalleled breadth of maritime activity that makes up the London's shipowning and maritime services sector. The UK, and London in particular, is the world's leading centre for the provision of professional services to the international maritime community. In a highly competitive era, Maritime London strives to ensure that the world's shipping community continues to choose to do business in the city. Its membership is representative of the whole spectrum of London's maritime activity and includes:

- arbitrators and mediators
- average adjusters
- bankers
- classification societies
- insurance brokers
- lawyers
- port operators
- shipbrokers
- shipowners and ship managers
- surveyors
- the Maritime Officers Union
- underwriters and P&I Clubs
- universities and training colleges.

The cluster group works to increase London's profile and to promote its member companies. It provides full company listings and links from the its website, access to London's shipping network, networking meetings, a regular newsletter for members, support for overseas marketing, representation for its members interests – nationally and internationally – and access to the Corporation and the mayoralty of the City of London.

Marine South West

Marine South West was formed in 2000, to increase the business competitiveness of marine-sector companies in the South West region. It is supported by a group of

public sector bodies which includes the South West Regional Development Agency, the Government Office for the South West, SEMTA and the British Marine Federation. The company has a Board of non-executive directors and strategy is directed by a Task Force which is composed of representatives of the partner bodies and prominent people from the marine business community.

The current business plan, 2005-2007, is based on a budget of £4 million (€6 million) and is funded by the partners. The principal activities are:

- a network of 'demand-led' Marine Skills Centres across the region: Poole, Falmouth and Plymouth;
- support for 4 local marine networks across the region: Poole, South Devon, Plymouth and Cornwall;
- Schools Marine Challenge, a competition to promote the marine sector as a careers option;
- 'Lean Marine' – a productivity improvement programme through supply chains;
- an export development programme; and
- communications and profile-raising, including conferences, website, newsletter, etc.

Mersey Maritime

Established in 2002, Mersey Maritime represents the maritime cluster of 1,000 companies focused on Liverpool, employing 26,000 people with a turnover of £3 billion (€4.4 million) per annum. It exists to promote and develop excellence in all maritime-related activities in Merseyside and to represent the interests of existing and new cluster members.
Mersey Maritime has been formed through the commitment of its private and public sector partners with the shared vision of developing a world-class cluster of maritime businesses. It aims to:

- grow tonnage, turnover and profitability;
- increase employment numbers;
- galvanise all 1,000 companies into forward-looking entities with highly skilled, motivated and customer-focused staff;
- communicate Mersey Maritime as modern growth business;
- make Mersey Maritime the destination for world-class training facilities;
- integrate the communication with all local communities on key issues;
- become the champion of Mersey Maritime business on a lobbying platform;
- fulfil and enhance its environmental duty;
- build up the region as a centre of excellence for logistics;
- make the Mersey Maritime Cluster the first successful one of its kind in the UK.

Marine South East

Marine South East is the regional marine initiative of the South East of England Development Agency, developed to address the needs of the marine sector in the South East region. Its role is to identify projects of strategic importance to the sector's growth and to work with sector teams and partnerships to support increased

economic development of the marine sector in the South East. The current portfolio includes a variety of business-led projects targeting increased productivity, including: access to new technologies for innovation, adoption of lean practices and development of advanced workforce skills.

The South East marine sector is estimated to employ over 60,000 people, achieving a turnover in excess of £10 billion (€14.5 billion) and contributing around £5 billion (€7.3 billion) to the region's gross value added. The sector is dominated by small firms. 95% of marine companies in the region are Small and Medium-sized Enterprises and 50% have fewer than six employees. The sector includes activities in leisure marine, commercial and offshore equipment, ports and shipping, marine services and contracting, ship building and repair, trade associations, research, education and training.

In terms of the leisure marine sector, the South East is the largest UK region by revenue with industry revenue of £769 million(€1,120 million) recorded in 2004, and over 9,000 leisure marine employees, representing respectively 39% and 32%of the total country.

The Marine South East website provides a key information source for marine companies within the region with details of marine networking events, a database of marine companies, a library of marine information, and news and information on the marine sector in the South East.

National Level

Nationally, individual sectors already engage in clustering for policy and other purposes through a strong and long-standing network of trade associations. Hence, the Chamber of Shipping represents all aspects of UK-based shipping, covering several very distinct and diverse trades (container, tanker, dry bulk, passenger – cruise and ferry, offshore support, etc) and provides the secretariat for others (tugs, rig-owners, etc). The Society of Maritime Industries is the voice of the UK's business sector which builds and refits warships, and supplies equipment and services for all types of commercial and naval platforms, ports and terminal infrastructure, offshore oil and gas structures and marine science and technology services. Others act with similarly broad umbrella functions spanning different sectors but through a single focus.

Professional training and skills

One area in which there has been particularly effective cluster activity is in the development of training and professional skills. Because of the nature of maritime business, the skills required span a very wide range of relevant sector groupings from manufacturing to shipping operations, marine "agriculture" and fishing, the food industry, underwater technology, maritime law and many more.

Two cluster groupings are emerging which work together as required. The first – the **Maritime Skills Alliance (MSA)** – brings together the shipping, ports, fishing and

other maritime services sectors and also includes certain aspects of leisure boating. Its mission statement is: "to become the focal point for UK Maritime Skills issues and to work together to provide the Maritime Sector with the skilled workforce that it needs to compete effectively in a global economy".

Formally established in January 2004 as the focus for UK Maritime Skills within the Government's Skills for Business Network, the scope of the MSA was originally defined in an independent Government-funded study published in 2004. It included industries where the principal business activities covered the control management and operation of harbours, ports and vessels associated with sea transport, leisure cruising, loading and unloading cargo and passengers; catching fish and shellfish; and supporting offshore exploration, surveying and other sub-sea activities.

The Alliance has a principle of offering membership to other employer-based organisations that have a mutual interest in the skill needs of the maritime sector. Consequently in January 2006 the British Marine Federation, jointly with the Royal Yachting Association, became members. The MSA's scope thus now includes commercial activities related to the use of waterborne craft on rivers, inland waterways and lakes. Several other marine related employer based organisations have indicated some interest in working with the MSA, and it is likely that an associate class of membership will be introduced to accommodate the differing needs of some of these organisations.

Memoranda of Understanding have been put in place with a wide range of other "sector skills councils" across activities which have an interface with the maritime sector.

The findings of a Labour Market Assessment of the Sector in February 2005, commissioned with Government support, have been used as a basis for developing a strategic plan; this analyses the factors that will impact on the labour market and future skill requirements for the whole sector. It defines the sector's priorities, and sets out a living action plan of how these will be addressed.

The second skills cluster grouping is the marine Sector Strategy Group (MSSG) within the wider **Science, Engineering, Manufacturing Technologies Alliance (SEMTA)**. This is one of 12 Sector Strategy Groups set up by SEMTA and pulls together the training and skills needs and programmes for the shipbuilding and ship-repair industry (including submarines), boatbuilding and boat-repair, marine equipment and manufacture. This sector covers an estimated 57,000 employers.

The MSSG will make recommendations to the SEMTA Board, Government, administrations of the devolved nations, and key agencies throughout the UK on policies and priorities for improving skills and productivity in its subsectors by:

- providing strategic leadership in the work of SEMTA and the sector;
- driving delivery of the sector's Skills Agreement with Government;
- raising critical issues that impact on the sector's competitiveness; and
- achieving recognition as a "body of influence".

While SEMTA is one of the path-finding "sector skills councils" in the UK (because its footprint is wider than just the maritime component), the employment in the cluster represented by the MSA is not high enough numerically to be recognised as a sector skills council in its own right. On the other hand, the MSA is seeking to achieve independent recognition because of the very specific nature of sea-going and other maritime employment.

8.4 Political Influence

This chapter is written at an exciting time in the evolution of the UK's maritime cluster since much activity has occurred over the last year to begin to develop the political influence of the UK's maritime cluster as a whole – in addition to that of its individual partners. Much of this was prompted by a debate launched by Sir Michael Savory, the 2005 Lord Mayor of the City of London who encouraged the emergence of a new informal networking and discussion forum. The aim was to enable the different components of the maritime cluster to combine their energies on policy and political issues (in a way which would match the activity of Sea Vision UK on issues of profile and careers).

This led to the emergence of a new informal forum under the provisional title of "Maritime UK" which is currently in its early stages. Operating parallel to the Sea Vision activity, this grouping combines the commercial cluster at national level, with regional inputs on issues of policy. It enables the different national sectors and regional clusters to exchange views on relevant developments and to come together to take joint action where that is considered to be of value.

A secondary objective is to enable those elements of the cluster who are interested in particular issues to come together within the cluster (but not necessarily embracing the full "Maritime UK" grouping) to act together on specific issues. It is therefore a facilitator as well as an active promoter of common views.
The intention is to allow cross-sectoral working on a multi-lateral – as opposed to a bi-lateral – basis to gradually build up to the degree that that is considered useful. Its first project has been completed and produced a combined response to a major UK Government consultation ("The Marine Bill") in April 2006 which represented the views of some 16 different collective national and regional associations. The forum is now considering whether it would be useful for it to make a similar input in response to the EU Green Paper on Future Maritime Policy Consultation.

9. The Dutch Maritime Cluster

***by Henk Janssens*[45]**

9.1 The structure and importance of the Dutch Maritime Cluster

In 1994 a report was published that revolutionized the Dutch Shipping Policy. This report - "De Toekomst van de Nederlandse Zeevaartsector"[46], or in English "The Future of the Dutch Shipping Sector" was commissioned by the Ministry of Transport, Public Works and Water Management to prominent maritime academics and resulted in recommendation to shift objectives that formed the basis for shipping policies. Instead of focussing on maintaining a Dutch flagged fleet manned by Dutch nationals, and promote the development of modern and specialised vessels, the report recommended to create a competitive cost level for Dutch ship owners and a national shipping policy that would maximize "added value" and "employment" through maintaining and increasing maritime activities in the Netherlands. Based on an Economic Impact Study it was established that only 30% of the Added Value of the Shipping Sector could be attributed to activities at sea, whereas 70% of the Added Value was created onshore in direct and indirect activities. Traditional shipping policy was not really focussing on this. Aware of the potential of the onshore activities the policy emphasis changed to attracting new ship owning companies, promoting maritime activities in related maritime sectors, whilst offering an international level playing field for the ship owner, whether flying the Dutch or any other flag.

The Dutch Ministry of Transport and the shipping division in particular have keenly advocated the report's recommendations and acted to introduce policy measures swiftly. The 1st of January 1996 the new shipping laws came into effect with measures like tonnage tax, additional fiscal facilities for crews, more freedom in manning regulation, and promotion, education and research.

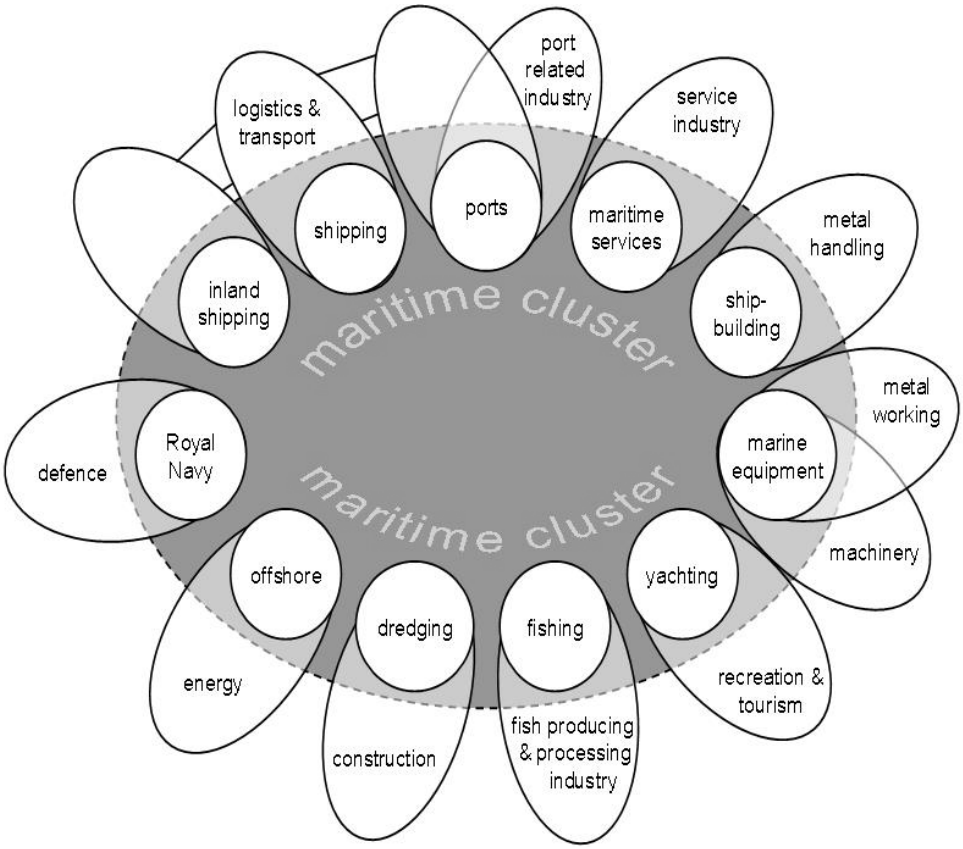
Consequently the attention then turned to the related maritime sectors. Together with the Ministry of Economic Affairs the Transport Ministry facilitated the development of the Dutch Maritime Network (in Dutch: Nederland Maritiem Land). In April 1997 a group of prominent maritime industrialists agreed to set up a foundation with that name, and with a mission "to promote and reinforce the Dutch Maritime Cluster". At that moment the maritime cluster was not well defined and was deemed to consist of the shipping-, shipbuilding-, offshore-, dredging-, inland shipping- and port sectors. It also lacked good statistical sectoral and cluster data. The Dutch Central Bureau of Statistics collects data in a format that does not allow easy insights in the maritime aspects of economic activities. A fundamental decision therefore was taken to start an economic survey based on a "bottom-up" procedure, very costly and time-consuming, but allowing to establish the true value and interrelations of (divisions of)

[45] Henk Janssens is Managing Director of the Dutch Maritime Network

[46] Peeters, Wijnolst et al., De Toekomst van de Nederlandse Zeevaartsector, Economische Impact studie en Beleidsanalyse, Delft University Press, 1994.

companies involved in maritime activities. Whilst these studies had commenced, the Dutch Maritime Network was approached by other sectors claiming to be part of the Maritime Cluster: Marine Equipment Suppliers, Royal Navy, Yacht Building Industry, Fisheries and Maritime Services Industries. These sectors also proved to have important maritime components.
The internal relationship in the maritime cluster and their relationship with other non - maritime sectors can be visualized as follows.

Figure 1 - The Dutch Maritime Cluster



Source: Policy Research Corporation

In 1999 a concluding report[47]on the Dutch Maritime Cluster was published by the Dutch Maritime Network.
The main conclusion was that the totality of the Dutch maritime sectors indeed make up a **maritime cluster** in accordance with the definitions of Prof. Michael Porter [48]. Strong internal economic relations, a rapid diffusion of innovation, connecting links in transport chains and overlapping labour markets between maritime sectors underline this conclusion. The Dutch Maritime Cluster is a very complete one with sectors of comparable importance, but also very valuable for the Dutch Economy as shown in Figure 2.

[47] Peeters, et. al., De Nederlandse Maritieme Cluster, Economische Betekenis en Structuur, Dutch Maritime Network series, no 13, 1999
[48] Porter, The Competitive Advantage of Nations, Harvard Business Review 1990

Figure 2 - The Dutch Maritime Cluster,: Economic Indicators 1997 - 2002 (in € billion)

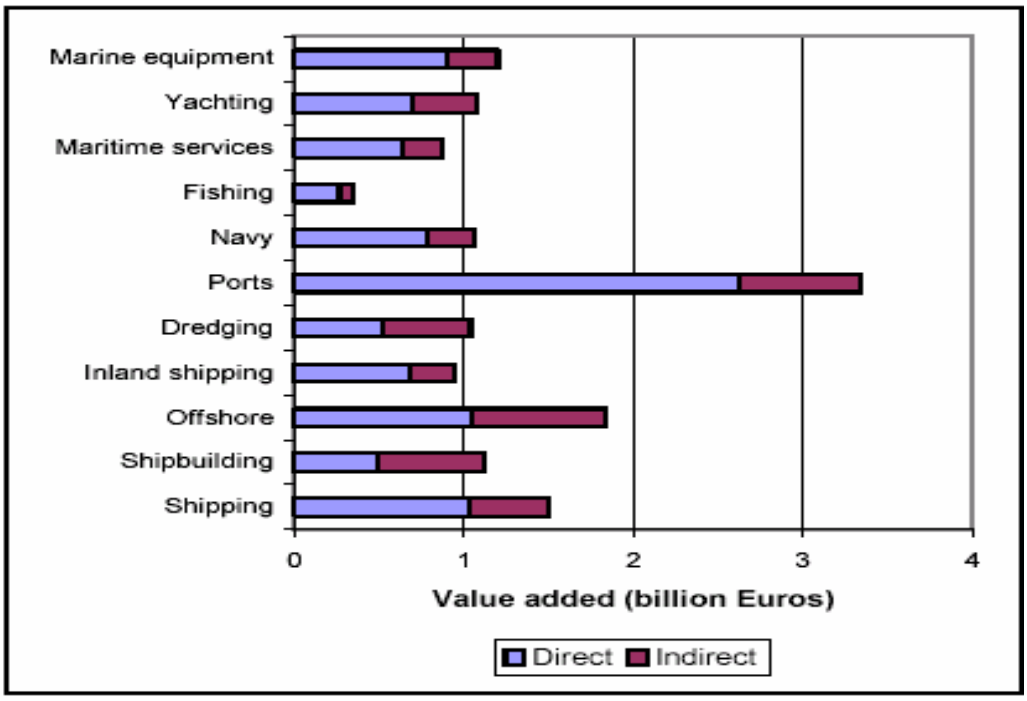
	1997	2002
Turnover	17.8	21.4
Export	9.9	12.6
Production Value	15.3	18.5
Direct Value Added	8.0	9.5
Total Value Added	10.9	12.6
Employment - Direct		135.000
- Total		190.000
Number of Companies		11.500
In relation to the Dutch Economy		
– Added Value		2,9 % GNP
– Export		5,4 % total Export
– Total Backflow		€ 4,5 billion

Source: Policy Research Corporation

As indicated the Dutch are keen players on international markets selling nearly two thirds of their goods and services abroad.

The Dutch Maritime Cluster is also well balanced as the 2002 monitor indicates, with an exceptional importance for the port sector, and a relatively smaller fisheries sector.

Figure 3 - The Dutch Maritime Cluster - Value Added per sector 2002

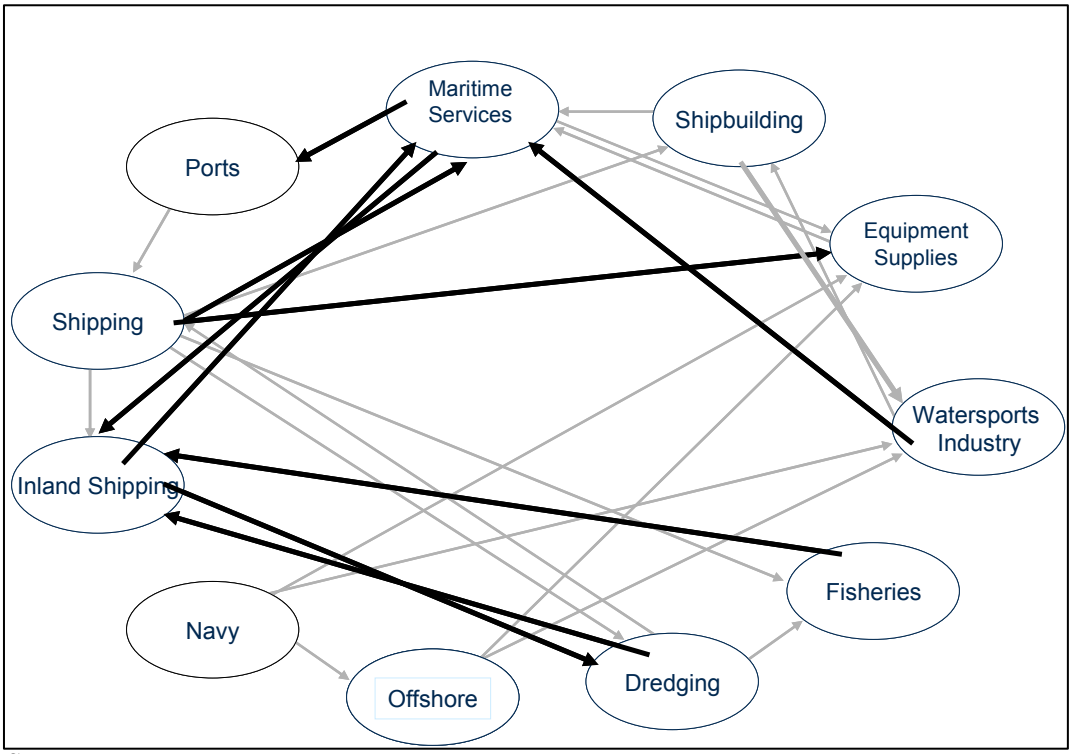


Source: Policy Research Corporation

It should be noted that economic data only have been collected from companies that are statutory established in the Netherlands. Some sectors such as dredging and fishing have considerable interest in foreign companies. In these cases only the profitability of these international activities is regarded in the Value Added.

Also of interest is the overlapping in labour markets in the maritime cluster. From a labour market study [49] conducted in 2003 the following picture can be drawn on the intermobility of maritime professionals over the maritime sectors.

Figure 4 - Personnel mobility within the maritime cluster



Source: Ecorys

A number of maritime sectors are leading on a European or even world level. Ports, Dredging, Inland Shipping, Mega Yachts. But the Netherlands have also leading niche players in short sea shipping, heavy lift and transport, towage and salvage, short sea ships, dredging equipment, workboats, integrated systems, offshore support industry, geological survey, model testing etc.

A new economic monitor is underway for the year 2006, undoubtedly showing improving figures for same sectors, resulting from a boom in trade flows, shipbuilding, energy demands, large world-wide land reclamation projects, and growing leisure business. But some sectors will continue to remain under pressure, because of reduced fish quota, cuts in defence spending, and continuing rationalization in inland shipping.

[49] Van der Aa et al., Monitor Maritieme Arbeidsmarkt 2003, Dutch Maritime Network Series No 27, 2004

The Dutch maritime business communities are organized in trade organizations, who in turn participate in the Dutch Maritime Network. The Dutch knowledge institutes like Marin, the research institute TNO, the Technical University of Delft and the Royal Institute for the Navy participate in the Maritime Knowledge Centre (in Dutch: Maritiem Kennis Centrum). For easy communication and joint action both cluster organizations have cross participations and share some board members and observers. Additionally both the Ministry of Transport and of Economic Affairs are represented by observers.

9.2 The key competitive factors of the Dutch Maritime Cluster

No doubt the countries location close to a rich but perilous sea has shaped The Netherlands as a maritime nation. The rich sea has inspired the Dutch to take to the sea and go after rich fishing stocks. The navigational experience gained allowed the Dutch to go in trade and shipping taking part in littoral trade, in the Hanseatic League from the Baltic and as far as Portugal.
The exclusion of the Dutch in the lucrative spice trade from Lisbon has prompted traders to establish direct connections with the spice islands in the East Indies and cross trade from there into the Indian subcontinent and the Far East as far as Japan. New possible trade opportunities induced the Dutch also to discover new sailing routes, new continents and establish trading posts. The ports of Amsterdam, Rotterdam and Middelburg became very wealthy through bustling trade and maritime activities.

The perilous sea also invoked the Dutch sense of community in jointly addressing the dangers of the sea, financing and building dykes, creating polders, windmills, canals, and waterways. It created the knowledge and experience of how to deal with land and water economically in often life threatening circumstances. This knowledge created also the opportunities for inland waterway systems and trade on rivers and canals allowing cities and industries to develop, which in turn fuelled demand for more transport and waterways.

And the same holds true today. Europe's Gateway, the Port of Rotterdam, and the Port of Amsterdam, still Europe's nr. 5 port, thank their existence of their location close to the sea, and a well developed river and canal system that allows inland navigation as far as Switzerland or even the Black Sea. In absence of natural harbours Dutch civil engineers and dredging companies have created man made ports that allow the largest of modern vessels to enter fully laden into the Rotterdam Port, and Cape Size ships through locks into Amsterdam.

Large and efficiently transported product flows have developed the Dutch ports into turntables of goods, transhipping to and from a large number of smaller West European and Baltic ports. It also necessitated the development of vessels in varying sizes and specialities, handling equipment and storage facilities with all sorts of supporting activities: workboats, floating sheerlegs, dredgers, salvage, etc….

Additionally the discovery of large natural gas volumes in The Netherlands extending well on to the continental shelf required offshore tools to be developed.

Transport of rigs and offshore installation has lead to the development of heavy lift and transport equipment for construction and fabrication, exploration, drilling and production.
So the key factors that have shaped the maritime cluster in The Netherlands have been its location close to the sea with its easily accessible hinterland, the riches in and below the sea, and the determination and cooperation of its people defending themselves against the water while seizing its opportunities. It has lead to a large, well balanced maritime cluster, with some 11.500 maritime companies within a 100 km radius.

This includes some 50 outstanding leader firms and a number well known maritime knowledge institutes. The proximity of so many companies in such a limited geographical area has created an important interrelationship between companies, low transaction costs, low innovation thresholds and rapid diffusion of new knowledge.

Or as some people say, the key competitive factor of the Dutch Maritime Cluster is the cluster itself. The fact that so many companies are so close together, that you can buy anything you want, in an atmosphere of competition and complementarity; that fact is basis of the cluster's success.

This cluster has been developed and renewed in a history of hundreds of years and has established a strong basis in the Dutch economy. However the long history also created a situation in which the maritime cluster is taken for granted by a growing part of the Dutch society. That could create a dangerous situation because only continuous drive and innovation can maintain a leading position in a very competitive world market.

9.3 Dutch Maritime and Economic Policy

As in other European countries the maritime cluster in the Netherlands is not governed by one maritime Ministry, but by a number of Departments.

The Ministry of Transport, Public Works and Water Management, (the Directorate General Civil Aviation and Freight Transport) is responsible for the sectors shipping, inland waterways and ports, and the nautical aspects of the dredging- and fisheries sectors. The Ministry moreover is responsible for nautical safety, sea defence and waterways and as such a major commissioner for the dredging sector.

The Ministry of Transport is organized in accordance with mentioned branches and as such conducts sectoral policies.

In realisation that the value of shipping is not only in ships and jobs at sea but mainly in economic activities on land, the shipping policy is designed to enable shipowners to trade their vessels from the Netherlands on competitive and profitable terms. It aims to create an internationally level playing field, whilst retaining for the owner a quality flag and a strong maritime environment.

An important item of this package of measures is the option to the shipowner to determine annual fiscal profits on the basis of his ship's tonnage, irrespective of the

(EU!) flag under which it sails. The Dutch flag offers additional benefits, more flexible manning regulations and additional fiscal measures reducing the cost of employing Netherlands' crews with some 30%.
The flexible manning regulations have been made possible by the introduction of the Manning Act 1996, incorporating STCW-Requirements. Certification for Dutch ships are simple. Ratings from all nationalities may be employed on Netherlands'-flagged vessels. Captains with Dutch, European Union, Icelandic or Norwegian nationality can be equally employed.

The Ministry is also involved in maritime research and nautical education. The latter is an integrated part of the Dutch education system and offers the possibility of an integrated, dual educated Maritime Officer, that combines the functions of Navigation Officer, Engineer and Radio-operator.

For the maritime world the Transport Ministry offers innovation support for the shipping, inland shipping and port sector. For the shipping sector an innovation arrangement has been developed, based on market demand and network building. The Dutch Maritime Network is actively involved in the management of the programme, known as the "Maritime Innovation Board". In this programme the Dutch Shipowners play a leading role, while other relevant stakeholders such as Shipyards, Equipment Suppliers, Ports, Logistics and knowledge institutes are involved. The Board is made up by ceo's of leading maritime firms and trade organisations. It's total budget amounts to 10 million Euro over a four year period. Finally the Shipping Division of the Transport Ministry supports the Maritime Cluster approach and is a major contributor to the Dutch Maritime Network Foundation.

The Ministry of Economic Affairs is involved in the shipbuilding, yachtbuilding, marine equipment supply as well as the offshore sectors, and is also in general terms responsible for Innovation and Export in the Dutch economy.
The Ministry carries out a generic industrial policy aimed at creating a positive business climate, an international level playing field, a stable and robust economy, a reduction of the regulatory framework, and attractive fiscal climate. Over the last couple of years the Ministry is giving more attention to sectors / clusters in the economy that have the potential to become international centres of excellence. The maritime cluster is one of these key areas.

So challenged by the Ministry, the Dutch Maritime Network and the Maritime Knowledge Center, together with companies and trade organisations have presented an Innovation Vision Document and Strategic Research Agenda for the Maritime Manufacturing and Construction Industry, the Dredging Sector, and the Offshore Sector. At the time of writing these Innovation ideas have been well received, and the maritime cluster is hopeful that an innovation support structure as well as an organizational body will be in place shortly.

With respect to the pursuit of an international level playing field. The Ministry does not follow automatically the policy options as made possible by the European

Commission. A good example is the R, D&I support that member states can offer to the shipbuilding industry following the European LeaderSHIP 2015 discussion. Some member states have raced to put support structures in place, but the Dutch Ministry rather likes to be persuaded, and presses the business community to make their case.

The Ministry through its Directorate-General for Enterprise and Innovation supports the Maritime Cluster and is a contributor to the Dutch Maritime Network Foundation, not only in general terms, but more specifically in the area of Innovation.

This includes a small but effective support tot the innovation activities of the Dutch Maritime Network, in fact a sort of incubator facility that allows the Network and innovation specialists from the participating maritime trade organisations tot formulate innovation ideas and limited prefeasibilities. This approach has triggered some interesting ideas.

Finally, the Fisheries Sector and the Royal Dutch Navy are under the guidance of the Ministry of Agriculture and of Defence respectively.

In conclusion it is fair to say that the Ministries of Transport and of Economic Affairs have enabled the establishment of a maritime cluster with the development of the cluster organisation Dutch Maritime Network. Both Ministries are not actively pursuing a Maritime Cluster Policy but are quite prepared to listen to the Cluster and act accordingly. In the Dutch case an active network has proven to be the key to success.

9.4 European Maritime Policy and Dutch Priorities

As a "maritime nation" in its broadest sense The Netherlands follow the discussion on a new European Maritime Policy with great interest. This holds true for the Dutch government, for the Dutch Maritime Network, as well as trade organisations and some maritime leader firms.

In the preparation of the Green Paper, the Dutch Ministry of Transport has come forward with a position paper. The Netherlands agrees with the Commission that a holistic and integrated approach to maritime affairs would help to avoid conflicts and to optimize synergies between the various sea-based activities in and along European Waters. This approach should boost the economic potential and safeguard the environment. However The Netherlands also considers that established balances as developed by national and international authorities should not be distorted by new European Maritime Policies.
For the Netherlands sea and coastal areas (North Sea and Waddenzee) the present established balance between economic functions and the natural and environmental values should be maintained. In the Dutch opinion a new European Maritime policy should also recognize and accept international and global conventions and agreements as well as well established regional agreements and cooperative practices.

Therefore the Dutch position paper suggest the Maritime Policy Taskforce to built on existing policies and practices through a *horizontal* approach, on a limited number of priority and strategic policy themes.

These should include:

1. *Sustainable economic growth.*
   Following the Lisbon strategy this is a strategic pillar for the European Union. The Netherlands consider that there is further room for enhancing and facilitating the efficiency of shipping operations; the stimulation of short sea shipping; the exploitations of new forms of energy; sustainable fisheries and the promotion of tourism in maritime areas.
   The policy framework should also deal with issues of reducing the regulative and administrative burden for the industry and consider the benefits of a maritime cluster approach for Europe.

2. *Ecological sustainable use of the Seas and Maritime environmental protection.*
   The Dutch position paper calls for an integration of environmental issues at the level of Member States, but also in relation to other EU policy fields. The application of an ecosystem based approach, as highlighted and emphasized by the *European Marine Strategy* should deliver the environmental pillar in a wider maritime policy context.

3. *Spatial Planning.*
   Human activities at sea or near shore may conflict mutually or with environmental or ecological objectives in marine protected areas. Spatial planning may therefore be needed to reduce such conflicts and the potential impact. The position paper underlines the need for general principles and guidance for spatial planning in European waters, and for better understanding of the impact of human activities. However the principles of subsidiarity are upheld.

4. *Innovation, research and development.*
   The Netherlands consider that the Green Paper should address the important issue of R,D&I. Continuous and programmatic development of know-how and expertise of oceans and seas is necessary to integrate science, technology, research and innovation with industry and policy makers. Europe should develop R&D programs that support technical development and innovation, as well as sustainable development and economic growth.

5. *Synergy, co-operation and good governance.*
   Again the Dutch position paper considers that European Maritime Policy should address general principles for synergy, co-operation and good governance, but should recognize international global conventions, established regional agreements and cooperative practices.

The Dutch Maritime Network - so mandated by the Government during the second Maritime Clusters Roundtable to pursue maritime cluster interests on a European level - has been active in the Green Paper debate on three levels.

Firstly, together with the European Network of Maritime Clusters a position paper has been submitted calling for a better statistical underpinning of the Economic Importance of the European Maritime Clusters; the interrelationship between the sectors; the direct and indirect Added Value; export-, and employment data. It is recommended:

- to establish a clear definition of the European Maritime Cluster and its constituent sectors
- to investigate in how far the Eurostat statistical system could provide solid data to establish the importance of the European Maritime Cluster to carry out an EU25-wide statistical survey.

Secondly the Dutch Maritime Network together with the European Network of Maritime Clusters has contributed to a coherent approach from stakeholders to the development of the Maritime Policy Green Paper by organising - in cooperation with the European Commission - a European Maritime Policy Conference (Brussels, 17 November 2005). On this conference some 30 position papers have been submitted by the relevant European Maritime Trade organisations, Worker's federations, knowledge institutes, environmental agencies and other interested parties.
The conference was opened by Mr. Barroso, and contributions were made by EU commissioners and Ministers, and representatives of the participating organisations. Some 250 delegates have attended the meeting. (Proceedings and position papers have been published in the Dutch Maritime Network series publication number 29).

And on a national level the Dutch Maritime Network has organised the Dutch trade organisations in a discussion with the Dutch Government on issues related to the new European Maritime Policy. In this way the Dutch trade organisations can contribute their views through the Dutch Government as well as through their European trade organisations.

The Green Paper on an integrated European Maritime Policy has been published in June 2006 and a new round of consultation will take place. In the Netherlands this consultation is organized by the interdepartmental working group IDON (Inter-departmental Platform of Directors with regards to the North Sea).

The Netherlands have also taken the initiative to organise a high level conference on ministerial level of the 7th European MAIG Countries on European Maritime Policy. This will take place in Rotterdam, February 2007.

The Dutch Maritime Network and the European Network of Maritime Clusters will organize a second conference in Brussels on November 23, 2006 to discuss the development of the European Maritime Policy against a more European political perspective.

9.5 Future Outlook: a sea of opportunities.

The maritime cluster is presently doing very well in nearly all its sectors and the underlying long term trends remain positive. International trade is expected to continue to grow resulting in more transport of raw materials and semifinished or finished products. Demand for energy will continue to increase and the search for oil will extend into offshore areas that are more difficult and hostile to exploration and exploitation. Liquefied Natural Gas will increase in importance necessitating new transport systems, ships, terminals, liquefying and regassification installations and distribution systems. Increase of activities in littoral areas, whether housing, ports and airports, industry and tourism will stimulate landreclamation and dredging works. Global warming and climate change will call for more protection of vulnerable coastal zones. Growing population and wealth will continue to increase demand for (sea) food and tourism. All these developments point to further increase of activities in the maritime cluster, new challenges requiring expansion, new technology and new systems.

But also society presses for more and further changes. Within the modal split sea and inland waterways offer opportunities to reduce pressure on the motorways and reduce road traffic infarcts. The need for lower emissions of noxious gases and fine particles necessitate the developments of cleaner engines and cleaner energy sources. Security requirements will further change platform design and operational methods in waterborne activities. Environmental considerations demand for solutions for ballastwaterproblems, paint systems, etc., etc.

There should be many opportunities in new materials, new designs, digital developments in order for the maritime cluster in the Netherlands (and Europe for that matter) to provide answers and solutions, and to lead in further product-, and process developments in the world. The focus should be on innovation, an increase in R,D&I expenditure and intensity. But also by strengthening national and European innovation networks and supporting facilitating cluster organisations. The perspective of the European Commission as stated in Chapter 2 is therefore received with great interest. Cluster policies should be developed on national and international level to create a framework for coherent action.

The Dutch Maritime Network is strongly convinced that now is the right time to pursue the opportunities for the maritime clusters. Entrepreneurs, while these companies run at high capacity levels, should now invest in new and innovative ideas. Governments - Dutch and European - should now create the conditions for further growth and development: an international level playing field, stimuli for research and innovation, adequate learning and training facilities for new maritime talents. Only if we act now it will be possible to act from strength: a window of opportunities not to be missed.

10. Maritime Cluster Policy and the Green Paper

***by Niko Wijnolst*[50]**

10.1 Introduction

In March 2005 the European Commission adopted a communication from its president Barroso and commissioner Borg which carried the title "*Towards a future Maritime Policy for the Union: A European vision for the oceans and the seas*."
The objectives of this initiative are summarized as follows:

- Oceans and seas are a vital resource for life on earth. They play a key part in our economic, social and cultural life. They are an important source of wealth with great potential for development. Ensuring the sustainable use of the marine environment is a prerequisite for that potential to be fully realised.
- There is growing international recognition that ocean and sea affairs are interlinked and require a comprehensive approach, and there is a clear move towards such an approach in many parts of the world.
- A strong case can be made for Europe to look at ocean an sea affairs in a more coordinated way, rather than in the current sectoral manner. The Strategic Objectives of the Commission for 2005-2009 noted "*the particular need for an all-embracing maritime policy aimed at developing a thriving maritime economy and the full potential of sea-based activity in an environmentally sustainable way*."
- A Green Paper on a future EU Maritime Policy, to be adopted by the Commission in the first half of 2006, will constitute a first step towards the establishment of an all-embracing EU Maritime Policy, in line with the Commission's objectives.
- The Communication establishes the Maritime Policy Task Force that will bring this process forward and takes note of the decision of the President to create a Steering Group of Commissioners that will direct its work.

As part of this consultation process, a European Maritime Policy Conference was organised in Brussels on 17 November 2005 by the Dutch Maritime Network and Mare Forum, in association with the European Network of Maritime Clusters, and in close cooperation with the European Commission's Maritime Policy Task Force.
The Proceedings[51] of the conference have been published which illustrate the broad dimensions of the European maritime interests, but also the commitment of the maritime industry organisations to contribute pro-actively to the Commission's initiative.

A holistic approach to the European Maritime Policy coincides with the emerging trend around the world for various sectors to organise itself around entire value chains. The European maritime industry is a show-case in this respect as the previous chapters illustrate. The maritime sectors in many EU Members States have organised

[50] Niko Wijnolst is Chairman of the European Network of Maritime Clusters
[51] European Maritime Policy Conference Proceedings, Dutch Maritime Network Publication 29, December 2006.

themselves in well-structured networks that create economic synergies at many levels: innovation, exports, labour market, policy making and so on.
The success of the clustered approach within the maritime value chains has induced also a clustering on a European level. Although this trend is emerging, its potential can be demonstrated by the recent work and success of the European Waterborne Technology Platform. In this platform the entire European maritime cluster has collaborated in the formulation of a Vision 2020 document on which basis a Strategic Research Agenda has been presented. This collective European effort demonstrates the need and potential of a wider clustered collaboration.

The initiative of the European Commission to define the contents and boundaries of a Future European Maritime policy coincides well the nascent maritime cluster trend. The question is what to include in this future policy and what to leave to the discretion of the member states. The subsidiarity principle is one of main political issues from a member states' perspective. The future European Maritime Policy is not meant to lead to a straightjacket-type of Policy Framework. The rhetoric questions in the introduction to the Green Paper illustrate this clearly:

- *Should the EU have an integrated maritime policy?*
- *How can the EU add value to the many national, local and private initiatives which already exist in the maritime field?*

This chapter will start with an analysis of the European Maritime Policy Green Paper[52]. It will be followed by a brief discussion of maritime cluster enablers, as well as the potential role of maritime clusters in uniting the fragmented European maritime value chains. The chapter will be concluded with a vision of the future to ensure the leading position of Europe as a maritime superpower.

10.2 The Green Paper

The Green Paper is structured around five themes which will be discussed in more detail.

10.2.1 Retaining Europe's leadership in sustainable maritime development

Europe has a huge maritime economy with a strong global position. The key objective behind the Maritime Policy initiative is to maintain *A competitive maritime industry*. Sound policies and programmes can help boost competitiveness, as shown by LeaderSHIP 2015, addressing the future competitiveness of the shipbuilding industry. The strength of the European maritime industry lies first of all in its own entrepreneurship and ability to innovate. The question is how to maintain and strengthen the competitiveness of the maritime cluster. A condition is the availability of the highest quality production factors, such as the oceans, scientific knowledge and a well educated and experienced workforce. Economic competitiveness should be achieved under the stringent condition of sustainability. What mechanisms should be in place to ensure that?

[52] European Maritime Policy **Green Paper**, published 31 May 2006, website http://ec.europa.eu/maritimeaffairs

The sustainable use of our marine resources implies the preservation of the oceans and seas. The Commission has adopted a Thematic Strategy for the Marine Environment which will deliver the environmental pillar of a future maritime policy. The strategy introduces the principle of eco-system based spatial planning without which the often conflicting uses of the seas cannot be managed. A common vision of the many users of the oceans and seas should lead to a convergence of policy views. Maritime transport and ports, fisheries, integrated coastal zone management, regional policy, energy policy, marine research and technology policies should ultimately share the same sustainability paradigm. That seems to be a very ambitious task, but perceptions may change rapidly as the maritime safety policy illustrates. Within a short period, Europe created the European Maritime Safety Agency and initiated many proposals to protect the marine environment which have now come into force. Regional initiatives such as the Baltic Sea States Subregional Cooperation are supported by EU funds for the implementation of important policy measures.

Remaining at the cutting edge of knowledge and technology is not only necessary to maintain the European lead in advanced products, but also to make informed policy choices and prevent degradation of the marine environment. Marine research efforts need to be increased to underpin and support the sustainable use and management of the marine resources, and a better understanding of ocean dynamics. This will be reflected in the allocation of funds within the 7th Framework Programme. It is essential that marine and maritime related research is considered as a whole, integrating many disciplines, national and pan-European research agenda's. The Waterborne Technology Platform is a successful example of the maritime cluster to formulate a truly European strategic research agenda. The important Exclusive Economic Zones and continental shelves might require a European initiative towards cooperation with third countries on mutual research. Finally, Europe should also focus on global issues such as climate change and the role of ocean systems, weather cycles and biodiversity.

Three challenges of the future will emphasis the need for the marine and maritime community for *Innovation under (dramatically) changing circumstances*: climate change, energy resources scarcity, and blue technology. Climate change is expected to have a major impact on Europe. Oceans play an important role in the adsorption of CO2, but this causes an acidification of the oceans with consequent damage to the eco-systems, affecting the marine food chains. The maritime sectors, in particular shipping, should make efforts to increase energy efficiency and reduce exhaust emissions, in line with the Air Thematic Strategy recently adopted by the Commission. Energy resources, such as oil and gas, become scarce and new sources can only be found at sea and in deep oceans. The Green Paper stresses the potential of the seas to build offshore renewable energy installations[53]. "Blue technology" is a

[53] Note: the Green Paper does not touch upon the importance of deepsea offshore developments, neither addresses the issue of an overall European Energy Policy. Given the strategic nature of energy supply for the competitiveness of Europe, and the crucial role of the European offshore industry, this topic should be added to the discussion.

concept comprising the development of new products that can be obtained through the exploitation of our rich marine biodiversity. Multilateral agreements on the protection of marine biodiversity are needed to safeguard this potential of blue technology. Member states could include this issue in their roadmaps for the implementation of the Environmental Technologies Action Plan.

Highly qualified human resources are a prerequisite for a vibrant maritime and marine industry. *Developing Europe's maritime skills and expanding sustainable maritime employment* is therefore a major topic within the overall theme of retaining Europe's leadership. The structural lack of well trained European seafarers may jeopardize the future competitive edge of the maritime industry. A key factor to reverse the downward trend of seagoing employment in the EU is to encourage job mobility between sectors. This depends on the recognition and implementation of the concept of maritime clusters. The EU should support a proactive approach to manage labour mobility and facilitate retraining and professional orientation. The maritime clusters could contribute by creating transparency in maritime job qualifications and employment opportunities within the many maritime sectors. Besides, the EU should stimulate the continuous upgrading of the curricula of the nautical and maritime educational institutions and promote best practices.

Maritime sectors are all part of a big maritime cluster. Such local, national and European networks of interrelated maritime companies and institutions are able to increase the competitiveness within in the global economy. *Maritime clustering* is thus one of the tools for the EU to achieve its policy objectives, for example by sharing knowledge, carrying out joint research and innovation, pooling education and training, and so on. Exploiting the potential of clustering is especially relevant in sectors with complex supply chains involving manufacturing and services and a large number of small enterprises. The maritime sectors like shipbuilding and offshore, provide ample illustrations of these complex relationships. Strengthening maritime cluster awareness, not only at the national and European levels, but also at the regional and local level will contribute to enhance the maritime competitiveness of Europe as a whole. Maritime clusters do not form a standard statistical unit and therefore policy relevant data are hard to come by. This issue should be addressed in order to have a solid basis from which to devise policies and measure its impacts.

In sectors such as shipping, port infrastructure and offshore resource exploitation, where large investments are being made in innovative products designed to last for decades, a stable *regulatory framework* is important. This is the last element discussed under this heading. Within the EU work is underway with a view to simplifying and streamlining regulation, and these efforts should also be directed at regulations covering maritime and related sectors. An example is a Commission proposal for a modernised customs code. Existing rules have to be enforced which poses several challenges when this applies to the vast oceans and seas. Self regulation, despite its limits, and Corporate Social Responsibility may have important and complementary roles to play. Appropriate incentive mechanisms should be promoted for shipowners with a good track record, for example by offering lower costs in ports and fewer security checks. A comprehensive review of the regulatory and structural framework should identify how economic incentives can be

further improved across maritime sectors, including shipping. The Commission intends to issue guidelines on the application of competition rules to all remaining forms of cooperation in the maritime transport sector. Monitoring and enforcement of international rules and regulations on flag states, in particular on those with independent ship registers, is another priority for the Commission. The potential of an optional European quality register could be contemplated, associated with a number of incentives aiming to encourage flagging-in.
As regards fisheries, the Commission will shortly adopt a plan on how to implement the maximum sustainable yield concept in the Common Fisheries Policy, thus reducing over-fishing and negative environmental impacts on sensitive habitats.

10.2.2 Maximising quality of life in coastal regions

A healthy marine environment is essential for the quality of life of an increasing number of citizens in coastal regions. The various threats to the coast and its inhabitants should be dealt with and turned into opportunities, among which maritime tourism. The often complex interaction between maritime and land-based activities requires also special attention.

The increasing attraction of the littoral as a place to live and work is difficult to measure as comprehensive statistics are not really available. It is estimated that close to half the European population lives along or near our coasts. Recreational activities at the beaches will suffer from a deterioration of the marine environment, which can lead to widespread algal blooms in the Baltic or Adriatic, significantly reducing the quality of life. The Commission believes that a comprehensive study of these "non-market value" economic indicators should be undertaken in order to provide decision-makers and stakeholders with a quantitative view of coastal issues and trends across Europe. Coastal zones, in particular small islands, require special attention in relation to a range of quality of life aspects, such as accessibility and general interest services (health care, etc.) during peak tourist seasons.

Adapting to coastal risks like erosion, flooding, storms and tsunamis, is the reverse of protection of the oceans and seas. These risks can be managed by adaptation strategies for coastal and offshore infrastructure, sea defences and marine ecosystems that sustain maritime activities. The severe changes in weather cycles which are attributed to climate change have fundamental repercussions on coastal infrastructure, shipping, aquaculture and marine engineering projects, while half of Europe's wetlands may permanently disappear under the sea. This requires an incorporation of risks in planning and investment decisions. The EU should stimulate the development of novel ways to deal with these risks, which may create an important export product for European companies in the future. However, what is needed is an inventory of risk reduction policies and responses, including coastal defence mechanisms and plans that exist in the Member States and at the EU level. The enhancement of civil and military cooperation for disaster relief should be considered.
Man-made risks like pollution from rivers and ships, or illegal migration, piracy and terrorism is yet another category of risks which should be addressed. This requires

harmonisation of disparities in Member States' legislation and the implementation of international instruments such as the ISPS Code. The monitoring of EU waters involves considerable resources such as surface, air and satellite surveillance and vessel tracking systems, and would benefit from further integration.

Developing coastal tourism is the subject of the Commission's European Agenda 21 for the sustainability of European tourism. The diversification of tourism products and services can contribute to the competitiveness of coastal and island destinations and can lead to an extension of the tourism season, creating more growth and employment and reducing the environmental peak impacts. An important success factor is the availability of maritime infrastructure (marina's) for the yachting activities, including sports fishing.

Managing the land-sea interface, or rather in formal terms "integrated coastal zone management (ICZM)" is a challenge for planners and policy-makers. Integration of the diverse interests under a single integrated management will increase the speed and quality of economic development in coastal zones. The EU Parliament and the Council have adopted a recommendation whereby Member States should develop ICZM strategies with their regional and local authorities and other stakeholders. Progress will be monitored in the current year. The pollution contained in the affluent of rivers, accumulates in some of the seas like the Baltic Sea which is shallow and semi-closed. As ecosystem management of coastal waters develops on the basis of the Thematic Strategy for the Marine Environment, it is likely that land-based measures will have to be taken to reduce the pollution at sea. The unique position of ports within coastal regions and their role within the logistics chain of shipping and transport services warrants special attention as ports have become multifunctional nodal points. Economic growth will result in the continuous expansion of these ports. This will require a change in the current planning and public policy framework and an integration with environmental policies, such as the EU regulations under Natura 2000 and the Birds and Habitats Directives. Regional maritime clusters may play a crucial role in the coordination of all the interests.

10.2.3 Providing the tools to manage our relations with the oceans

The implementation of the marine strategy will require the detailed assessment of the state of the marine environment in Europe. Better understanding of the competing uses of the seas and oceans will require *better data and information on maritime activities*. However, there are still major problems of harmonisation and reliability of data collected, as well as insufficient and geographically imbalanced monitoring in EU marine regions. These gaps need to be addressed in order to devise a sound and sustainable maritime policy. The creation of a European Marine Observation Data Network could be considered. The availability of such a network could spur new commercial activities like marine surveillance to management of marine resources.
Creating such a Network would require the EU to take legislative, institutional and financial steps. The Global Monitoring for Environment and Security (GMES) initiative could contribute to such a Network. Data on vessel movements would be part of such a Network. The data will not only be used for navigational purposes, but may also contribute to the detection of illegal behaviour or monitoring of fishing

vessels positions for control purposes. In EU waters an additional requirement would be full interoperability between Member State systems and sectors, in close cooperation with neighbouring countries like Russia and the partners in the European Economic Area, Norway and Iceland.

The Commission is of the opinion that *spatial planning for a growing maritime economy* in the waters under jurisdiction of or controlled by the Member States should be created. A broad debate is needed on the principles which should underlie such planning, while it is evident that any maritime spatial planning system should be coherent with ICZM. As economic activity moves increasingly further offshore, the EU and its Member States will need to take the lead in ensuring that multilateral rules evolve to allow for reconciling the right of innocent passage with the increased need for offshore spatial planning.

Coastal regions receive financial support from several EU policies. The main source is the Cohesion Policy, namely the Structural Funds (European Regional Development Fund, European Social Fund), the aim of which is to reduce regional disparities. The EU and Member States should *make the most of the financial support for coastal regions*. Consideration should also be given to whether other EU financial instruments such as funding though the EIB, EAFRD, 7th RTD-Framework Programme and LIFE could be made available. It will also be necessary to reflect on how an emerging EU Maritime Policy will be presented in the future budget structure of the EU.

10.2.4 Maritime governance

A future EU maritime policy has to take into account the principles set out in the Treaty in relation to policy areas and the distribution of competences between the EU institutions, the Member States, the regions and the local authorities. It should contribute to the EU aim at growth and more and better jobs, thus helping to develop a strong, growing, competitive and sustainable maritime economy in harmony with the marine environment. *Policy making within the EU* requires a stronger coordination and integration among sectoral policies. Sea related policies also have to take into account the commitments undertaken in the context of the 2002 World Summit on Sustainable Development and the provisions of UNCLOS.
EU maritime policy making can be partly implemented through existing institutions, including the Economic and Social Committee and the Committee of the Regions. Sectoral advisory bodies set up by the Council (e.g. Regional Councils in the Fisheries Sector) or the Commission (Sectoral Industry and Civil Society advisory committees, scientific advisory committees for different sectors) will, however, have to be supplemented by appropriate cross sectoral bodies.
The Commission has already taken steps towards strengthening its internal coordination on ocean and sea affairs and expects this to be reflected in its policy proposals for the future. An example is the UN-Oceans office, which coordinates twelve different UN organisations.
Where appropriate, Member States should use existing regional organisations whose activities impact on maritime activities, such as HELCOM for the Baltic region,

OSPAR for the North East Atlantic region, the UN-MAP and the Barcelona Process for the Mediterranean region.
The offshore policy integration of governments relating to territorial waters and Exclusive Economic Zones (EEZs) vary greatly between Member States. In some countries a single authority (coastguard, police or armed forces) is responsible for almost all functions. In other Member States search and rescue, customs control, border control, fisheries inspection, environmental controls are entrusted to different authorities which use different instruments to fulfil these tasks. A movement towards more coordination between these activities and among Member States could be conducive to the development of a more integrated approach and to greater efficiency. As has been the case on land, the trend on the seas seems to be towards a "Common EU maritime space", governed by the same rules for safety, security, environmental protection and border control. It could also put shortsea shipping in the same situation as transport on land between Member States.

Maritime activities transcend by their very nature the boundaries of Europe and are therefore best *regulated on the basis of international rules*. The EU can use its external policy leverage to encourage third countries to improve the application of these international rules and regulations. The EU should place particular emphasis on using its external policy to establish an international level playing field, in particular where this is required to ensure fair competition for economic operators. In some cases it is necessary to use the forum of the WTO to the fullest extent possible.
When it comes to rule-making in a multilateral context, the EU should strive to ensure coherence, transparency, efficiency and simplicity of rules relating to oceans and seas, in particular within UNCLOS. The UNCLOS regime for EEZ and international straits restricts the possibility of coastal states to exercise jurisdiction over transiting ships, despite the fact that any pollution incident in these zones presents an imminent risk for them. The protection of the marine environment in waters beyond national jurisdiction, the relationship between UNCLOS and the Convention on Biological diversification needs clarification.
The role and status of the EU in international organisations dealing with maritime affairs needs to be reviewed, taking into account the fact that in several cases the issues under consideration fall within the exclusive competence of the EU. With regard to Community membership of IMO, the Commission has made its views clear in the Recommendation on this issue in 2002. A special issue concerns the UN Convention on Conditions for Registration of Ships, containing a definition of genuine link between flag state and the vessel. The UN General Assembly invited IMO to undertake a study on this topic and the Commission is looking forward to its results.
The sensitivity of the genuine link debate in the context of shipping should not prevent progress as to fisheries. The international community has acknowledged that addressing this problem is a key element in the fight against illegal, unregulated and unreported fishing, which is perhaps the most widespread illegal activity on the sea.

Although a *European maritime policy* needs a general framework, its implementation *will need to take account of realities of Europe's geographical situation*. For example, EU Member States' overseas territories provide a worldwide dimension to

European Maritime Policy. Ecological characteristics of the coasts and seas vary widely, which makes a uniform approach difficult.

10.2.5 Reclaiming Europe's maritime heritage and reaffirming Europe's maritime identity

The Commission believes that there is much to be gained by encouraging a sense of common identity among all those who earn their living from maritime activities or whose quality of life is significantly connected to the sea. This can foster a better understanding of the complex relationships involved and the importance of the seas for human life, as well as to a better understanding of the contribution of maritime activities to the economy and well-being. The result can be a more favourable image of maritime activities, an appreciation of their growth potential, and a greater interest in choosing a career related to them. "The continuity between the past, present and future needs to guide and inspire European, national and regional strategies, policies and actions related to cultural heritage."

10.3 System Boundaries, Lack of Data and Policy Hierarchy

The Green Paper on a Future Maritime Policy for the EU focuses on five themes:

- Retaining Europe's leadership in sustainable maritime development;
- Maximising quality of life in coastal regions;
- Providing the tools to manage our relations with the oceans;
- Maritime governance;
- Reclaiming Europe's maritime heritage and reaffirming Europe's maritime identity.

The first two themes raise the issue of the system boundaries of the future maritime policy. A very broad definition as used in the Green Paper is a "catch all", but poses the inherent problem that it may become too complex to handle. Apart from that, as the third theme identifies, there is a serious lack of data on the relevant maritime and marine sectors and topics which makes it difficult to formulate, measure and monitor unbiased performance criteria. Without such a solid quantitative basis, defining the fourth theme of maritime governance becomes even harder. The future maritime policy is related to so many other international, national and EU policies, that it will take leadership to unravel the Gordian knot. The final theme of the European maritime identity may get a boost by the all out effort of the Commission to stimulate and seduce Member States to contribute to the Green Paper consultation process which will run from 7 June 2006 until 30 June 2007.
The following sections will discuss the three main challenges of the current Green Paper: system boundaries, lack of data, policy hierarchy.

Maritime Policy System Boundaries
The system boundaries of the Green Paper can be defined on the basis of various dimensions, like geographical, economic, environmental, social. The geographical dimension in the Green Paper varies from the world level, European level, regional level (i.e. Baltic Region), member state level, EEZ and local level. The economic dimension varies from global competitiveness, level playing field, employment,

value added, export, innovation, to individual sectors such as fisheries, offshore, shipping, shipbuilding, and entire maritime clusters. The environment also has many dimensions, ranging from conditions for sustainable growth, knowledge about the oceans and the seas, erosion and coastal protection, marine pollution, offshore energy, climate change, depletion of the seas, biodiversity, pollution from land, habitat and water directives, safety and security, spatial planning. The social dimension ranges from employment and education, coastal tourism, illegal immigration, education, maritime heritage and identity, development. More dimensions could be added.
This short list illustrates the complex boundaries of the maritime system that the Green Paper attempts to define. It is not clear where we draw the limits. And that is not surprising as maritime and marine affairs are by its very nature global with multifaceted impacts. Nevertheless the Maritime Policy Task Force should have made an effort to define more clearly the system boundaries, as well as the dimensions that the future European maritime policy should encompass. The current "capita selecta" of topics and dimensions makes it difficult to focus on the core-issues of the Green Paper.

Lack of maritime and marine data
There is a serious lack of knowledge about the oceans and seas, the coasts, impact of human activities like dredging, the definition and measurement of maritime sectors and clusters, climate change and so on. Without a solid understanding of the complex relationships of the marine and maritime world, it is difficult to formulate performance criteria which can be used to formulate and monitor maritime policies.
Closing the scientific knowledge and data gaps should be a precursor to any effort to formulate a holistic European maritime policy. This will also facilitate the process of defining the system boundaries of Europe's maritime ambitions. This is a less glamorous task, but one that is absolutely necessary to avoid discussions on relevant variables, its measurement and future policy objectives.

Policy hierarchy
The United Nations Convention on the Law of the Sea (UNCLOS) is an example of a global maritime policy to which the Member States and the EU have subscribed and which governs a major part of the maritime and marine world. The International Maritime Organisation (IMO) is yet another example, but is focused on the shipping, shipbuilding and maritime equipment sectors. The Member States are part of regional policy fora with third countries, like the Helsinki Commission (HELCOM) for the Baltic Region. There are EU policies, like those related to the Cohesion policy, which address various (maritime) policy objectives, or sectoral policies like the EU Common Fisheries Policy. The EU influence or control over these policies varies widely. There are often issues of subsidiarity with Member States policies. This sets the scene for a major confusion of which maritime policies should be addressed by the EU and which policies should left to other policy levels.
Again, a clear delineation and hierarchy is lacking in the Green Paper, which will pose an extra hurdle for a structured discussion with Member States.

Recommendation
The Green Paper is an admirable attempt to define a European Maritime Policy Framework. However, the lack of clear system boundaries, the structural lack of data on maritime and marine affairs, as well the absence of a policy hierarchy and the complex links with other international and EU policy domains, does not facilitate the task of making a constructive contribution to the discussion. The Member States should therefore focus on these basic issues first, before more mundane themes like coastal tourism are addressed. "What is it that Member States want the EU to do?" comes before the answer of "How to organize it within an EU Maritime Policy".

10.4 Maritime Cluster Policy

European maritime networks
In the preceding chapters the role and structure of Maritime Clusters has been discussed, as well the rationale for a European cluster policy. The maritime sectors are traditionally organised on a sectoral basis, at the national and the European level. In order to reinforce cross-sectoral linkages between the various maritime sectors, the Maritime Industry Forum[54] (MIF) was created in 1992 as an initiative of the Commissioners Bangemann and Van Miert. The MIF had four Working Groups initially led by the Commission Services and later with Specialist Panels with industry chairmen. The main objective of the MIF was to address topics of common interest to the industry sectors and which sought to enhance their competitiveness. The 13th MIF Plenary Session will take place 5-6 October 2006 in Oslo.

At the national level the maritime sectors started to cooperate as well on the basis of an explicit or implicit cluster policy. This has led to the formation of many forms of cluster organisations in European countries and abroad. Cluster organisations in ten European countries have recently created a European Network of Maritime Clusters, which is a platform for the exchange of best practices. One of the common themes is the lack of common definitions of maritime sectors and clusters, as well the lack of consistent and up-to-date data on its structure. The European Network of Maritime Clusters has therefore asked the Maritime Policy Task Force to take initiatives to fill this serious statistical gap, which is a condition for maritime policy-making. The European Network of Maritime Clusters will meet on 21 September 2006 in London in order to discuss the various Cluster definitions and to come up with a recommendation to the Commission. Apart from that, the European Network of Maritime Clusters has been involved in the organisation of the European Maritime Policy Conference of 17 November 2005, and will be involved in the second conference on the Green Paper Debate[55], which take place in Brussels on 23 November 2006.

The intensive networking of maritime sectors and clusters at the national and European level, will contribute to the ambitions of the EU in retaining leadership in sustainable maritime development. A recent example of the benefits of cooperation at

[54] http://www.mif-eu.org/
[55] www.mareforum.com

the sectoral and Member State levels within maritime Europe is the Waterborne Technology Platform[56].

Waterborne TP
In December 2003 the Maritime Industries Forum initiated the process for the establishment of an Advisory Council for Waterborne Transport Research in Europe (subsequently named: Waterborne Technology Platform) functioning as a forum where all the stakeholders would agree on a medium to long term vision ("Vision 2020"), assess the key challenges for the maritime industry and waterborne transport and operations, would formulate the R&D actions to be fulfilled for meeting these challenges in a Strategic Research Agenda (SRA), and would promote the mobilisation of the necessary resources. The Waterborne TP was launched during the MIF-Plenary Session on 25 January 2005 in Bremen, in the presence of Günter Verheugen, Vice President of the European Commission.
The intensive cooperation of the maritime industry sectors, as well as the Member States has led to the publication of the Waterborne TP - Vision 2020 document in February 2006 and the Waterborne Strategic Research Agenda in May 2006. These two documents form a milestone of European Maritime cooperation at the company, sectoral, national, and European levels. And it serves as an template for future concerted actions. That future is now, as the work packages for the 7th RTD-Framework Programme are being prepared, on the basis of the Waterborne TP and 27 other European Technology Platform documents on Strategic Research Agenda's as discussed at the recent European Technology Platforms conference in Vienna[57].
Member States should promote the formation of maritime clusters as this is a very effective and low cost way to strengthen their national maritime policy, as well as the EU maritime policy. The network organisations like the MIF and European Network of Maritime Clusters can assist in this process, and help bring to an end the fragmentation of the maritime industries. This will contribute to the European maritime policy objectives as outlined in the Green Paper. A strong focus on the enablers of maritime cluster policy by the European Commission might be the end result. Maritime cluster policy should therefore be one of the cornerstones of future European Maritime policy.

10.5 Strengthening the Maritime Cluster Enablers

Creating performance excellence is achieved with the help of the process *enablers*. The translation of maritime cluster performance indicators into cluster enablers was discussed in European Maritime Clusters[58]. The various cluster performance indicators result in seven maritime cluster enablers, which are:

- Define the boundaries of the cluster, establish its economic significance and promote visibility;
- Define an industrial/economic policy and vision of the future;
- Strengthen demand pull sectors within the cluster;
- Monitor and maintain a level playing field;

[56] http://www.waterborne-tp.org/
[57] www.eu2006-technologyplatforms.at
[58] N. Wijnolst, J-I Jenssen, S.Sødal. *European Maritime Clusters*. Dutch Maritime Network Publication 25, November 2003.

- Promote exports and internationalisation;
- Strengthen innovation, R&D and leader firms;
- Strengthen maritime education and labour market.

Enabler 1: Define cluster, establish its significance and promote visibility

There are a number of obvious general conditions that have to be met if a cluster policy and cluster enablers are to be developed. If a country has, for example, a business climate in which entrepreneurial behaviour is not appreciated and stimulated, then it will be hard to involve a government in a process of consultation that may lead to an industrial policy. Or, if the value added by a cluster is very small, then it is difficult to draw government attention.
A major hurdle in getting focus on the importance of clusters in the economy is often the simple fact that a cluster does not exist statistically in most economies, as individual sectors of a cluster are often part of different statistical entities. The picture gets even more complicated when individual companies produce for maritime as well as non-maritime markets.
The first step should, therefore, be defining the sectors within a cluster and establish the key economic performance indicators and communicate these data. This is an important *enabler at the conceptual level* in the minds of the politicians, governments, labour force, educational institutions, the general public, and last but not least the entrepreneurs themselves. Without the right mindset, based on an accurate perception of reality, cluster policymaking is not possible.

Enabler 2: Define an industrial/economic cluster policy and a vision on the future

Once the (maritime) cluster has been made visible, it is important to understand its internal dynamics and the many relations between the sectors and sub-sectors of the cluster. The government should acknowledge these clusters as important building blocks of the economy. Sectors are always subject to changes in their competitive environment, and it is up to the government to create the right conditions for these sectors to adapt continuously, without distorting the level playing field of course. The industry should develop a vision on the future which should be a basic input of this government economic policy. Consultative procedures should be in place to monitor developments in the national and global economy and to adapt the economic policies to these new realities accordingly.

Enabler 3: Strengthen demand pull sectors

Maritime sectors can be categorised into two groups: demand pull and supply push sectors. The demand pull sectors use the capital equipment and services of the other sectors. Demand pull sectors, like shipping, can order capital equipment within the domestic cluster or outside. In the long-term, the supply push sectors are more vulnerable to foreign competition than the demand pull sectors. These sectors will buy their capital equipment and services from the lowest cost supplier, wherever located. Strong and viable maritime clusters depend, therefore, on strong and internationally oriented demand pull sectors, such as shipping, offshore, fishing, naval, dredging and inland shipping. In particular the shipping sector offers

opportunities for growth as the market is huge and the opportunities are many as the "boom" years of 2004 and 2005 have amply demonstrated.
Cluster policy has been defined as an important enabler, but within a maritime cluster policy, demand pull sectors are the key-enablers of the cluster and should, therefore, be the focal point of government policies. The Norwegian and Dutch governments have implicitly understood this important driving function witnessing their innovative shipping policies of the past.

Enabler 4: Monitor and maintain a level playing field

Companies and whole sectors are confronted with unfair international competition. The WTO procedure from the European Commission against the unfair shipbuilding practices of South Korea was such an example. Denying market access, as is the case for many foreign maritime sectors in the United States because of the protective Jones Act, is clear evidence that it is not enough to be excellent as a company, if there does not exist a level playing field. Assuring *equal opportunity* for the maritime sectors in Europe is an important enabler for a sector and the cluster as a whole. Sometimes the level playing field can be created by the individual Member States, as was for example the case with the new Dutch shipping policy of 1996. Sometimes, the hurdles are such that the European Union has to step in, as was the case in shipbuilding.
Continuously monitoring of competition is an important aspect of any cluster policy. This should be done in close co-operation with the trade organisations and its members. Cluster growth is only enabled and assured if companies are not faced with unfair competition.

Enabler 5: Promote exports and internationalisation

Some countries have sizeable maritime home markets, unlike Norway and the Netherlands, which have to grow through exports and internationalisation. Reinforcing the level of exports and the number of companies that actively export is an important enabler of cluster growth and dynamics. Up to a certain level, exports can be done from the home country, beyond that level, companies have to internationalise their activities and start local production and services in export markets. This is often the case because of import levies, as for example the high import duty on equipment in China. Exports and internationalisation of companies, sectors and the cluster as a whole are basic enablers of maintaining a competitive cluster and creating cluster dynamics. It is also an important source of triggers for innovation, as foreign clients have specific demands.

Enabler 6: Strengthen innovation, R&D and leader firms

Companies can only maintain their export position in the long-term, when they constantly upgrade their products, services and production processes. This requires an advanced research and development infrastructure and policies that stimulate entrepreneurs to innovate, exchange information and take risks together. The leader firms in the cluster are able to set demanding standards, trigger innovation and even organise a number of companies (from the supply sectors) to address the innovation challenges. Innovation is an important enabler of cluster viability. Leader firms are

the anchor companies within a cluster and are important for the upgrading processes of the companies in a cluster. Monitoring and enabling leader firms, and in particular their role of enabling smaller suppliers to innovate, are essential elements to keep a vital cluster.

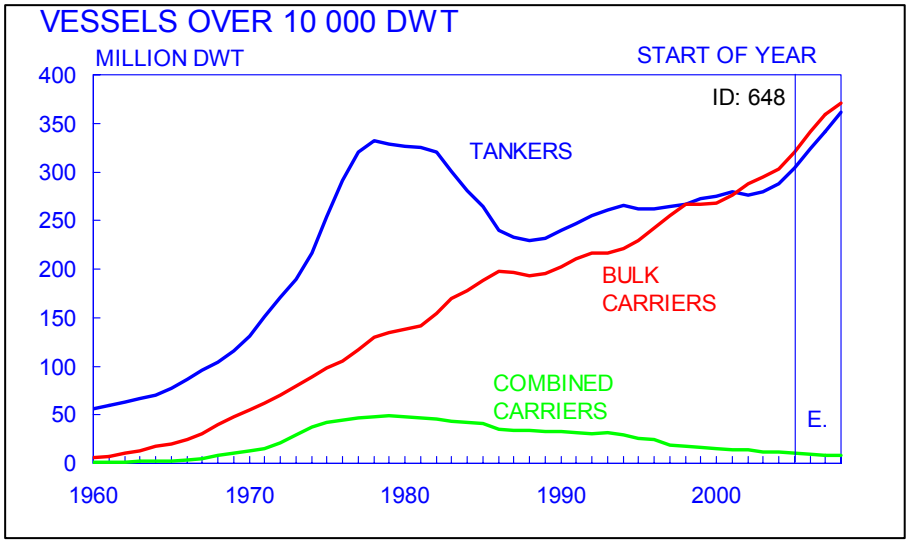
Enabler 7: Education and labour market

A high quality and complete maritime educational infrastructure, in combination with a transparent and large maritime labour market form together the seventh and last cluster enabler. Without well-educated individuals and sufficient career prospects within the sectors of the cluster, the future is not assured as an inflow of more and more highly-skilled people is a necessary condition for the modern operations, innovation, management, etc. Maintaining and strengthening the educational infrastructure is an important enabler, in particular for the nautical professions. Attracting the brightest people requires a positive image of the cluster, as well as a good two-way communication between the sectors and the general public. It is important to stress the opportunities for people with a nautical or maritime education and work experience within the entire maritime cluster and not only focus on the sectoral opportunities.

10.6 A Vision of the European Maritime Future

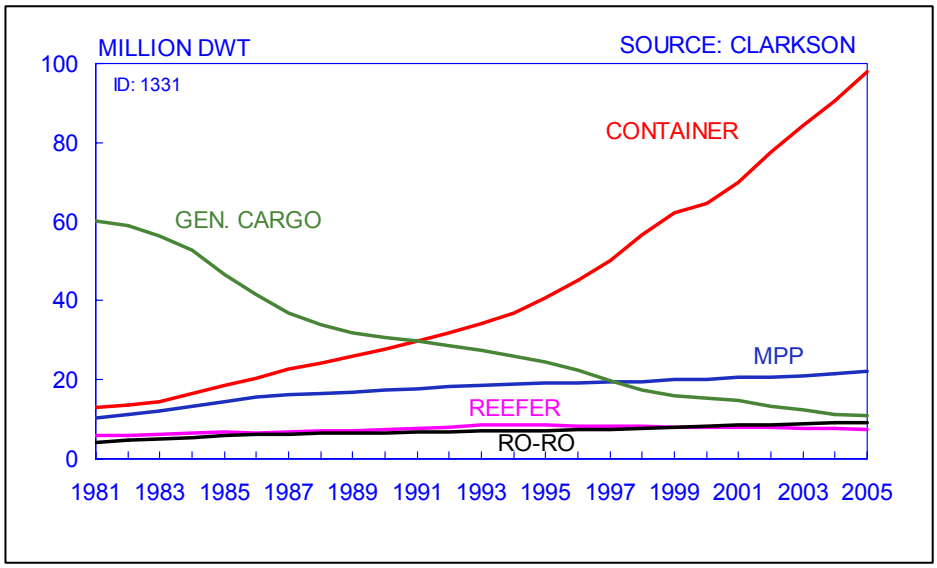
Maritime clusters can grow organically, but prominent maritime clusters may also perish as the case of New York illustrates[59]. In order to maintain a dynamic cluster, government policies should be directed towards strengthening the demand pull sectors within their clusters, and in particular shipping as this sector is the most important economic driver. The growth of the world fleet has been impressive as Figures 1 and 2 illustrate (source: Jarle Hammer/Fearnleys/Clarksons)

Figure 1 - Bulk vessel fleet1960 - 2008



[59] M. Levinson. *The Box; how the shipping container made the world smaller and the world economy bigger*. Princeton University Press, 2006, Chapter 5

Figure 2 -General cargo fleet development



The globalisation of the economy is experiencing its second wave, according to economists[60], which is illustrated by Figure 3. The first wave, starting in the beginning of the 20th century and ending with the Great Depression of the 1930s, was triggered by the availability of cheap transport over land (rail) and sea. The dramatic reduction in (maritime) transport costs stands at the basis of the first and second globalisation waves. World exports as percentage of world GDP peaked in the first wave in 1930 at around 9 percent, and declined thereafter as result of the protective trade measures. Only after various trade liberalisation rounds, and the introduction of cheap and fast container shipping, this peak percentage of the 1930s was attained again around 1970. Currently it is on its way to surpass the 20 percent mark.

Globalisation is visible not only in the export and trade statistics, but also in many other domains, and it is spreading like a wild fire. The driving forces behind this development are well described in Friedman's "The World is Flat"[61]. The end result will be continued growth in global economy, global trade and global shipping as the foremost transport mode.

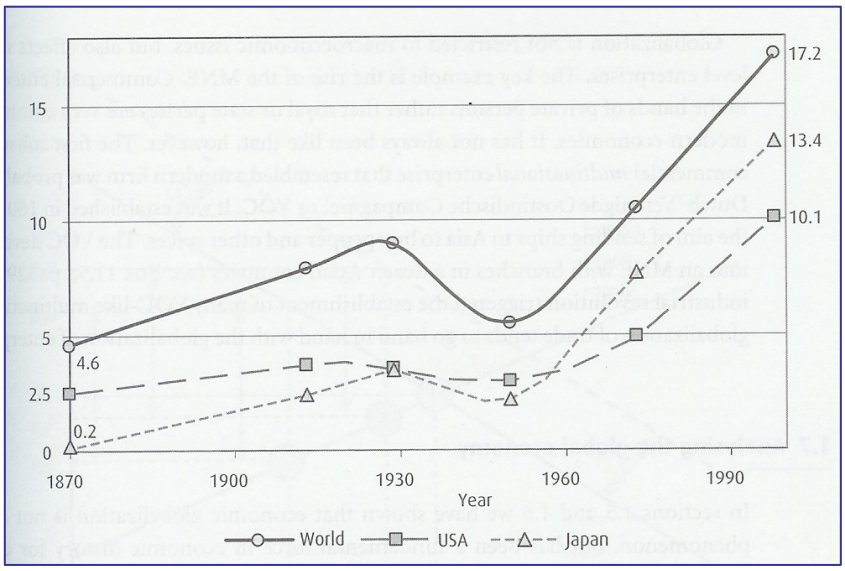
Shipping has always been a global activity, but managed from a strong home base. The severe shipping crisis of the mid-1980s, reinforced nascent structural changes in the organisation and management of shipping. The growth of the independent ship registers at the expense of the national registers, and the shift from national crews to international crews from developing countries set the scene for even more footloose behaviour of the shipping community. This is not the place to dwell upon the various causes and their pros and cons. Suffice it to say is that when the actual management of the shipping companies is moving out of a country, this will signal the impending demise of the traditional maritime clusters. Unless, it is replaced by other maritime

[60] S. Brakman, H. Garretsen, C. van Marrewijk, A. van Witteloostuijn. *Nationals and Firms in the Global Economy*. Cambridge University Press, 2006

[61] Thomas Friedman. *The World is Flat; a brief history of the globalized world in the 21st century*. Allen Lane, 2005

activities, such as the offshore industry. However, very few maritime sectors have a similar sizemarket as shipping which limits the alternatives drastically.

Figure 3 - Two 'waves' of globalization, merchandise exports, per cent of GDP in 1990 prices



Source: Maddison (2001, table F-5)

In spite of the many changes through globalisation, many basic management functions in shipping require a complete network of supporting industries in order to remain competitive. For example, innovation is not done in isolation and becomes much more difficult in a country with a less developed maritime cluster, like for example China. Strong local roots are thus a condition to remain a global player. European Member States should recognize this reality and act accordingly. Shipping and the entire maritime cluster are strategic sectors in the global economy with great economic value and potential. The future European Maritime Policy should reflect this.

11. European Maritime Clusters: Solving the definition and data puzzle

by Chris Peeters[62] and Harry Webers[63]

11.1 Introduction

The maritime cluster is an important economic cluster in the EU that has recently attracted renewed interest from politicians and policy makers. The maritime cluster has not always been recognised as a cluster in its own right in the past, partly because the *available statistical data* reveal an incomplete picture of the cluster and its interrelations with the rest of the economy. The shipping sector is probably the best-known sector in the maritime cluster, not least because of the attention paid to it by the Commission in order to secure an internationally level playing field. In addition, the cluster comprises shipbuilding, offshore (supply), inland shipping, dredging, seaports (and related services), fisheries, the water sports industry, maritime services, the marine equipment industry and the Navy[64].

The importance of reliable data cannot be overemphasised. Not only is it important to obtain an accurate view of a sector or a cluster of sectors and to measure changes over time, it is essential to be able to determine the driving forces behind changes over time: which factors determine the competitiveness of a sector and to what extent weaknesses and threats can be overcome and opportunities and strengths can be fully exploited. Consequently, in the context of this approach, 'data' will become *management information* which can be used for a variety of purposes. Firstly, it makes sectors and sub-sectors visible and provides them with an identity of their own. Secondly, it can be used to measure the impact of current strategies and policies and, thirdly, if required, the information and insights gathered may be used to further optimise current strategies and measures from a coherent perspective.
The aim of this contribution is thus to outline what has been learned from earlier experiences in the field and to show how important it is to provide an accurate view of the EU-25 maritime cluster.

Section 4.2 sketches the background to the current European shipping policy framework and describes the relation between the shipping sector and the maritime cluster. In addition it explains the approach which has been used to draw up the new shipping policy framework, paying particular attention to the role of data. *Section 4.3* focuses on some of the findings of a series of studies on the Dutch maritime cluster and on the experience derived from them. It also discusses the approach used in these studies in greater detail and shows the importance of strong interaction with key players in constructing the sectors' own identities. *Section 4.4* summarises the main

62 *Prof.dr. Chris Peeters, Policy Research Corporation N.V. and University of Antwerp*
63 *Dr. Harry Webers, Policy Research Corporation N.V.*
64 These are the sector definitions used by the Dutch Maritime Network. One of the aims of the study will be to determine whether these definitions can also usefully be applied when analysing the European Maritime Clusters.

findings of an earlier inventory study of the EU-15 maritime cluster, indicates the main shortcomings in the existing data and proposes ways of addressing these. *Section 4.5* outlines the prerequisites for an EU-25 study aimed at mapping the current situation. *Section 4.6* stresses the need for an EU-25 study from a decision-making perspective. *Section 4. 7* formulates the conclusions.

11.2 Shipping

Shipping is a strongly international and highly competitive sector. The very considerable differences in fiscal measures and social security systems worldwide resulted in an unprecedented number of ships being flagged out in the 80s and 90s. As one of the first in Europe, the Dutch government was very concerned about this evolution, especially because the loss of shipping activities would also adversely affect other maritime sectors such as shipbuilding and the maritime supply industry. A loss of shipping activity to other countries as a consequence of *flagging out* would endanger the development of other maritime sectors. Moreover, the drain of maritime knowledge would impact on the (future) development of other sectors[65].

In view of the circumstances prevailing at the time, an objective factual study was combined with a systematic process approach in order to keep all relevant players informed throughout the project, discuss the insights gained from data with them in detail and provide them with the necessary management information. The transparency in approach, the trust created, the objective data delivered and the strategic scenarios that were worked out succeeded in convincing all parties involved, such as the Ministry of Finance, the Unions and the sector representatives, of the need to adopt a non-sector (i.e. cluster) approach and take a number of measures.

The main factors for the success of the study that lay at the basis of the introduction of the shipping policy may be summarised as follows:

- *A solid approach*

  From the start all sectors and key players were involved so that a joint knowledge basis was created. The collection of undisputed data and the delivery of management information based on these data were vital to the acceptance of the findings of the analysis.

- *A thorough understanding of sector developments*

  Throughout the study phase it is always necessary to create a climate of trust between all sectors and all key players involved. In this particular case, a thorough understanding of the driving forces and the ability to combine the insights gained with information from other (data) sources proved to be essential in order to bridge the gap between theory and practice.

One of the most important building blocks of the Dutch shipping policy has turned out to be the tonnage tax system, whereby a fixed tax depending on the size of ships is levied. This ensured that the flagging out of ships was halted from the mid 90s onwards and that since then the strength of the national fleet has once again reached

[65] See C. Peeters, K. Debisschop, P. Vandendriessche, N. Wijnolst (1994).

its previous level[66]. Another important element in the policy has proved to be the introduction of flexible manning schemes which, while allowing for third-country seafarers[67], guarantee the quality of shipping operations. Since the introduction of the new shipping policy in 1996 the number of trading vessels and tugs sailing under the Dutch flag has increased by almost 50%. This evolution has also resulted in an increase in value added and employment, both in the shipping sector and in the supply industry[68]. Although at the time the Dutch model went against the prevailing European policy, it was nevertheless given the green light by the Commission. The main reason for this was that by means of the 'criterion of measurable benefit' – used to weigh the costs and benefits of policy – insight was provided into the value of the shipping sector for the European economy and into the unfair competition from 'flags of convenience' at the time.
The current guidelines stipulate that the total amount of aid granted (savings for the shipping sector) should not exceed the total amount of taxes and social contributions that would be collected from shipping activities and seafarers if no state aid was permitted[69].

Packages that are allowed:
- tonnage tax approximating zero corporate taxation;
- reduction in the social contributions of seafarers and shipping companies[70];
- reduction to zero of personal income tax for national seafarers.

The current framework for the shipping policy provides shipping companies with the opportunity to operate globally on a level playing field and ensures the sustainable embedding of shipping in the European economy[71]. It is positive that the policy framework has also been embraced by the new (maritime) member states and that

66 Avoiding payment of corporate tax is one of the main reasons worldwide for flagging out to open registers; for income from vessels under open registers, shipping companies do not pay any corporate tax. At the beginning of 2006, 52.9% of world tonnage was operated under open register flags (Bahamas, Bermuda, Cyprus, Liberia, Panama, Malta, Saint Vincent, Marshall Islands, Antigua & Barbados and Cayman Islands (ISL Market Analysis, 2006)). To increase the competitiveness of their shipping sectors, many European countries have adopted an optional tonnage tax system in order to have low taxes for shipping companies irrespective of the actual profit.

67 Clearly, keeping 'home' officers on board the ships helps to fill the necessary maritime knowledge base in a country.

68 For more details, see Webers, H. and Peeters, C., 'Dutch Maritime Cluster: Monitor and Dynamics' (October 2003).

69 Many EU/EEA countries have implemented measures to aid the shipping sector. Countries such as the United Kingdom, Germany, Belgium, Denmark, Norway, Ireland but also newcomers such as Latvia and Lithuania have adopted this policy.

70 It should be noted that the accession of new member states has consequences for the seafarers originating from these countries who work in other EU-member states (and EEA countries such as Norway) as in the long run EU shipping companies will have to pay social security contributions in their flag state for seafarers from other EU countries (EU Regulation 1408/71).

71 The European Network of Maritime Clusters aims to implement an integrated maritime policy framework. In November 2005 the first Conference was organised to set up such a policy consultation process (in order to provide building blocks for a Green Paper on Maritime Policy (scheduled for 2006)).

shipping can act as a facilitator for economic growth there. It is understood that the Commission will also monitor the way in which member states convert the guidelines into national legislation so as to guarantee a fair competitive environment, both now and in the future[72].

11.3 Experience and findings with regard to the Dutch maritime cluster

The various studies commissioned by the Dutch Maritime Network since the late nineties have proved to be very successful and have shown a clear picture of the importance of sectors and sub-sectors and the interrelations between sectors. Many sectors have been examined in detail, which has proved beneficial to providing them with an identity of their own. The sector of marine equipment is a case in point: a large number of firms have been identified and clustered, enabling the trade association Holland Marine Equipment (HME) to grow accordingly and to work out new strategies for growth and joint strategies with other sectors.
The definitions used in the study of the Dutch maritime cluster are:

Shipping

Shipbuilding

- Newbuilding seagoing vessels, repair seagoing vessels, conversion of vessels, newbuilding and repair other seagoing craft, newbuilding and repair inland vessels, newbuilding large yachts (> 24m), newbuilding and repair naval vessels

Offshore

- Exploitation and drilling services, construction and installation, engineering and project management, other offshore services

Inland shipping

- Motor ships dry cargo, tankers, container ships, tugs and pusher tugs, special (heavy) transport, inland ferries and cruise ships

Dredging

- Dredging worldwide, dredging Netherlands & Europe, small-scale dredging, auxiliary vessels, sand transport

Ports

- Stevedoring, shipping agencies, cargo agencies/forwarding, pilotage and mooring, port authority

Fisheries

- Freezer trawler, demersal fisheries, inland fisheries, shellfish fisheries

Yachting

- Yacht building > 24m, yacht building < 24m, wholesale trade, marinas and related services, ship-related services, yacht chartering and rentals

[72] At the end of December 2005, the EC announced actions against a series of EU-countries that were not in line with regard to their maritime policy. Greece and Portugal were reprimanded because they did not allow foreign service providers. Greece has also been given a final warning (before being brought to the European Court of Justice) because the country does not accept the exclusive jurisdiction of the European Commission with respect to its maritime transport policy.

Maritime services

- Salvage and diving, bunkering and ship chandlery, inspection and control, insurance and damage assessment, maritime research and consultancy, other business (legal services, financing, brokerage), non-profit (schooling, organisation, medical, inspection)

Marine equipment

- Power/propulsion, deck equipment, piping/pumps/compressors, cargo handling/ hydraulics/pneumatics, heating/ventilation/air conditioning/cooling, electricity and electronics, safety, interior, corrosion protection/isolation, metal products, product-related services

Royal Dutch Navy

- Operations, maintenance and engineering, education and research, staff and administration

The maritime industry in the Netherlands advocates a cluster policy focused on providing stability in the entrepreneurial climate. In particular uncertainties with regard to tax matters and the fiscal treatment of investments play a crucial role in the decision of (leader) firms as to whether to invest in a country. The main challenges and responsibilities facing the government -as perceived by maritime companies- are:

- Maintaining and strengthening the investment climate (transparency and uniformity of rules, fiscal stability);
- Continuing and with regard to certain points reactivating the successful shipping policy resulting in positive effects for the maritime industry as well as launching initiatives that will help to create a solid (maritime) 'cluster policy';
- Keeping internationally operating maritime leader firms headquartered in the country/ in the EU (transparency and long-term stability for investment decisions);
- Investing in knowledge creation, knowledge consumption and knowledge transfer;
- Promoting the (innovative) demand-driving role of sectors (leader firms).

11.4 Insights provided by the earlier study on the EU-15 maritime cluster

In the year 2000, the European Commission commissioned an inventory study on the European maritime cluster. Policy Research Corporation carried out this task and provided the initial insight into the size and scope of the European maritime clusters (for the EU-15) based on 1997 data[73]. This study calculated an approximate figure for turnover, value added, employment and expenditure effects, both in direct terms and in indirect terms (resulting from purchases in other sectors)[74].

[73] Study commissioned by the European Commission, DG Enterprise (contract reference number ETD/99/502486). For this assignment Policy Research Corporation collaborated with the Institute for Shipping Economics and Logistics (ISL). The definitions used in this study were in general less detailed or were clustered differently to those in the study of the Dutch maritime cluster, but basically the content was similar.

[74] Since its establishment in 1997 the Dutch Maritime Network has commissioned a number of studies to shed light on the size of the maritime cluster, the interrelations within the cluster and the contribution of the cluster to the national economy. For many sectors, complete bottom-up inventories have been made, resulting in a thorough understanding of the ins and outs of the

The main findings of this research project, entitled *Economic Impact of Maritime Industries in Europe*, were:

- overall rather low availability and quality of data (the statistics were in many cases incomplete, out-of-date or unreliable);
- difficult or impossible comparison between years, countries or sectors due to a lack of data and of uniform definitions;
- serious lack of data with respect to the economic importance of sectors such as ports and port-related services, the offshore supply sector and maritime services;
- lack of bottom-up data or a thorough top-down estimation scheme, which made it difficult to interpret data from the statistical sources[75].

Furthermore, the calculation of indirect effects was hindered by the limited information on interrelations between companies. Consequently, a more detailed examination of the relations between certain sectors (e.g. shipping and shipbuilding) was recommended. Even at the time the Commission was already convinced that further research into how to overcome the shortcomings mentioned would be beneficial, which is likely to be the case even more now because of the enlargement to EU-25.

In order to provide the reader with an approximate idea of the maritime cluster some key *facts and figures* derived from the Economic Impact Study are listed below:

- in 1997 the EU-15 maritime cluster generated a turnover of almost €160 billion, direct value added of about €70 billion (i.e. 1% of GDP) and direct employment for 1.5 million persons;
- (additional) indirect economic impact amounted to almost 60% of direct economic impact;
- in terms of direct value added, the United Kingdom had the largest maritime cluster, closely followed by Germany and Norway and then by the Netherlands and France;
- shipping and ports & related services were the largest maritime sectors; the closely-related sectors of marine equipment and shipbuilding were the third and fourth largest respectively.

What should be remembered is that the availability, quality and detail of existing data are too limited to be able to measure the importance of and the interrelations between sectors and countries. Definitions are not consistent, data are missing and no conclusions with regard to changes over time may be drawn on the basis of the data only. In order to be able to collect sound management information on the European maritime cluster, it is crucial to have a detailed set of data which is accepted by all parties involved and on the basis of which changes and facts can convincingly be explained. To obtain these insights, additional data on turnover, value added and

cluster. The studies have not only revealed a strong contribution of the cluster to the Dutch economy, but also a major contribution to international trade.

75 On the basis of statistical data it is usually not possible to distinguish between – for example – a relocation of certain (parts of) companies to other countries and an overall decrease in activity level. It should also be noted that more than half of the maritime sectors identified are not covered by official statistics.

employment need to be gathered so as to fill the gaps and refine rough estimates of the direct economic impact. In addition, details regarding the cost structure are needed so as to enable an accurate calculation to be made of the total economic impact of the European maritime cluster and of its inter-cluster and inter-country relations. Last but not least, a clear and uniform definition should be drawn up in close co-operation with all (sub-) sectors involved.

11.5 Requirements for an update: definitions and data

In order to be able to design a solid measurement framework that provides a detailed overview of the current economic impact of and the (border-crossing) interaction between sectors of the maritime clusters, it will be necessary to conduct a more detailed study. This study should aim to create identities peculiar to the individual sectors and to facilitate discussions on the basis of objective facts, bringing together the key players.

As in the previous Dutch case, during the study phase a carefully planned process aimed at creating a platform for consensus amongst key players will have to be implemented. The research process in particular turns out to be crucial in creating a basis for trust and building (or helping to build) bridges. Stimulating the transfer of knowledge and harmonizing the knowledge basis helps to eliminate some of the differences in knowledge and perception between parties.

For the European maritime cluster too, being able to discuss on the basis of objective facts is most likely to prove to be of great importance.

In a *first phase*, the challenge would therefore be to propose a clear and uniform definition of each of the maritime sectors, to test the availability (and quality) of data for strategic and policy purposes and to work out a strategy to fill the gaps in the statistical data and to enhance their quality[76]. This strategy should, amongst other things, include drawing up a solid benchmark case as well as devising a monitoring instrument enabling a regular (e.g. two-year) update. Even at this early stage, it will be of the utmost importance to establish close contacts with the various sector organisations involved and to include them as problem-owners.

These first steps should result in a 'strategic plan' with the following major elements:

- a proposal for a European standard for maritime cluster and sector definitions, taking into account current practices and regular statistical sources thus ensuring the best possible fit;

[76] A project outline for this phase should comprise the collection, analysis and assessment of data: mapping the differences in the definitions used in the various countries and investigating the 'match' of the maritime sectors in relation to the standard statistical classifications (in particular *Nomenclature des Activités économiques dans la Communauté Européenne (NACE))*, analysing the statistical data available for each of the sectors and performing a consistency check on the time series data, identifying the data sources in greater detail and gaining insight into the periodicity of the data sources available.

- an assessment of the availability and quality of economic and statistical studies and data for the EU-25 countries + Norway, complemented by an estimate of non-available data;
- an outline of the *Terms of Reference* for a possible research study for the EU-25 countries + Norway to collect 'missing data' and to work out procedures for practical statistical updates based on Eurostat material with a view to developing input-output analyses for the European maritime cluster on a regular basis.

In a *second phase*, the necessary in-depth research (to be proposed in the first phase) would be conducted. This includes taking all the necessary steps to provide reliable estimates for the different sectors. A stratified combination of top-down and bottom-up analysing techniques must be part of the approach. The calculation of the total direct economic impact of the European maritime clusters in terms of value added and employment is also made during this phase, as is the calculation of the indirect impact via purchases in other sectors, not only in the home country but also in the other EU-25 countries[77].

Some key observations on both the definition and data issues are given below.

Definition issues

Usually it is rather difficult to define precisely the 'content' of different economic activities, which means that finding a proper balance between sector-specific characteristics on the one hand and more general characteristics on the other is a constant challenge[78]. The main advantage of harmonisation on the basis of the NACE classification has been that the statistics for the EU-25 have become more comparable, although this has sometimes resulted in the loss of more detailed information on individual member states.

It should be borne in mind that due to the imperfect match between NACE classifications and sectors such as offshore supply, seaport and related services, recreation, maritime services, maritime equipment and the Navy a sound understanding of the inputs and outputs of the maritime sectors will be essential.

[77] A powerful means to perform this task is input-output analysis. Input-output tables consist of rows and columns specifying the cost structure and relations between sectors. The basic reasoning is that a change in demand will have a direct impact, not only on the sector producing the required product but also on all its supplying sectors. In turn the supplying sectors will also demand more input, and so on. This creates a 'ripple effect' which is felt throughout the economy. The strength of input-output analysis lies mainly in its ability to determine and summarise these multiplicative indirect effects on value added, employment and household incomes.

[78] Since no two firms are the same, there may in a strict sense be as many activities as companies. Via classifications this wide range of diverse activities is reduced to classes which are as homogeneous as possible as regards the most relevant criteria. Usually the activities are grouped on the basis of inputs, production processes and outputs. This makes it possible to combine statistical data with other information sources and hence to use the data for strategic and/or policy purposes. Most of the time, the classifications are designed on the basis of a top-down approach because in general this requires less sector expertise. As a result the statistical classifications are quite often less 'practical' from a sector perspective.

Taking these reservations into account, the following sector classification could be used as a starting point:

Shipping	Merchant shipping & ship management, shortsea shipping, cruise & ferry services, ocean towage *NACE 61.10 Sea and coastal water transport*
Shipbuilding	New-buildings (merchant ships, fishing boats, tugs, workboats, supply ships, floating sections, barges, dry docks, inland vessels, yachts, naval vessels) Repair and conversion of vessels Ship scrapping *NACE 35.11 Building and repairing of ships* *NACE 35.12 Building and repairing of pleasure and sporting boats*
Marine equipment	Manufacturing and wholesale trade in maritime equipment *NACE 29.11, 51.14, 51.65, 63.22 (partly)*
Offshore (supply)	Construction, installation and conversion of platforms, storage vessels & equipment, drilling and support services *NACE 28.11 Manufacture of metal structures (partly)* *NACE 63.22 Other supporting water transport activities (partly)*
Dredging	Dredging, river works, construction of dykes, sand transport, nautical cable and pipeline works for offshore *NACE 45.24 Construction of water projects* *NACE 61.20 Inland water transport (partly: sand transport)*
Inland shipping	Inland shipping (dry cargo, liquid bulk, containers, special transport), river and harbour towage, freighting, inland cruises and ferries *NACE 61.20 Inland navigation*
(Sea)ports	Cargo handling, shipping related storage, agency, maritime logistics & forwarding, port authorities, pilotage *NACE 63.11 Cargo handling (partly)* *NACE 63.22 Other supporting water transport activities (partly)*
Fishing	Maritime fishing, professional inland fishing, shellfish production *NACE 05.01 Fishing* *NACE 05.02 Fish farming*

Water recreation	Yacht construction (sporting, sailing and rowing boats, canoes, inflatable boats, floating sections) Repair Yacht renting & catering *NACE 35.12 Shipbuilding pleasure boats (partly)* *NACE 71.22 Renting of water transport equipment*
Maritime services	Bunkering, ship supply, rescue, diving, research & development, nautical training & education, maritime associations, maritime government services *NACE 63.22 Other supporting water transport activities (partly)*
Navy	Navy (operations, maintenance, staff and administration, education and research) *NACE 75.22 Defence activities (partly)*

Data issues

The various data issues can be divided into data-gathering, data-analysis and data-judgment.

Data-gathering phase

Data collection will be a first important step in the project. For countries such as the UK, France, the Netherlands, Germany and Norway several other detailed studies are available, while the earlier EU-15 maritime cluster study carried out by Policy Research Corporation also lists a large number of data sources. However, for many sectors and countries collecting substantial data material and evaluating the statistics available at the national statistical offices will require a considerable effort. In order to be able to discuss the relevance of existing data-sources close co-operation with the various trade and cluster organisations will be required.

Analysis phase

The main challenge here is to be able to provide a reasonable explanation of the statistical data at hand. The analysis or data assessment phase should result in a clear overview of the data available, the quality of the data, the differences between data sources and possible explanations for these differences.

Evaluation phase

On the basis of the findings of the data-gathering and data-analysis phases, an expert evaluation of the quality of the statistical data should be made. Moreover, a decision should be taken as to how to construct a consistent time series for a sector or propose the steps required to arrive at this stage. It is important here to consider the usual top-down approaches carefully in order to be able to evaluate the robustness of 'estimates' provided by statistical offices for the most recent years.

It is clear that in order to obtain relevant management information the assessment of data and the overall evaluation will require profound sector knowledge and a shared

understanding with sector organisations. It is essential that, first and foremost, agreement on the (sub-) sector definitions used should be reached within the EU and the European Network of Maritime Clusters. Despite the fact that there will be a relatively wide range of information available on certain sectors for a number of countries, much work remains to be done, not only for the less documented sectors but also in terms of (cross) quality check(s) of the available data. For about half of the EU-25 countries this may imply (some) field research.

11.6 Need for an EU-25 study

The success of the European shipping policy has proved that objective fact-and-figure findings constitute the starting point for the evaluation of future sector developments or the expected consequences of strategic and policy changes. The experience from the Dutch maritime cluster has shown that a cluster approach in which the success of the shipping sector is used to increase the dynamism of the whole maritime cluster really works. The efforts of the Dutch Maritime Network have to a very considerable extent contributed to the openness that currently characterises the Dutch maritime industry. People from a range of sectors have become acquainted and have come to appreciate each other, which has led to far more combined efforts, e.g. in covering export markets and pursuing innovation programmes. The studies have thus contributed to a growing awareness of the strengths and opportunities of the sectors in the cluster and have revealed new strategic opportunities for the companies involved.

The European economy, and the maritime cluster in particular, is increasingly becoming more interrelated and clearer insights into current and expected developments would be advantageous. Consistent and comprehensive data are a prerequisite if accurate observations are to be made but these, of course, require a sound understanding of the sectors and the forces at work in them. A study combining statistical information on the one hand with sector information from key players on the other, would ensure the delivery of the required management information.

The conclusion to be drawn from the earlier experience with regard to the Dutch maritime cluster is that the development of a maritime cluster strategy which will enable the sector to face the future with confidence is certainly worthwhile. On the basis of a thorough analysis at the European level, a fruitful dialogue with stakeholders should be ensured at an early stage so as to enable the key players to share insights and to create a platform for (ex)change (of ideas).

11.7 Conclusion

The European maritime cluster makes a very substantial contribution to the European economy and to international trade, although a precise overview cannot be given because of a lack of accurate information. It is estimated that the European maritime cluster creates over 1.5 million jobs and safeguarding these requires a balanced maritime policy. This is precisely what the European Commission under the presidency of Mr. Barroso has set out to achieve. The enthusiasm at the European Maritime Policy Conference held in Brussels on 17 November 2005 has shown

beyond doubt that the maritime industry is committed to participating pro-actively in the Commission's initiative to start a policy consultation process which started with the publication of a Green Paper on a European Maritime Policy.

In order to facilitate the decision-making process it will prove to be of crucial importance to produce a more detailed study of the EU-25 maritime cluster, focusing on measuring the impact of the cluster and the interrelations between sectors and countries. Such a study, aimed at delivering qualitatively reliable data and management information would give all sectors an identity of their own and bring together the various parties involved. This approach has proved its effectiveness, for example, by initiating the current cluster dynamism in the Netherlands it has helped the various sectors to become (better) acquainted and has enabled them to adapt their strategies (for example, with respect to export markets and innovation opportunities).

12. About the Authors

11.1

Dr **Paul Weissenberg** (1947) studied law at the Universities of Würzburg and Freiburg (Germany), followed by post-graduate studies in European law in Geneva (Switzerland) and by a PhD (Docteur en droit) in European law at the University of Geneva. Dr Weissenberg started working for the European Commission in 1989 as Member of Cabinet of Dr Martin Bangemann, Vice-President of the European Commission responsible for Industrial Policy. In 1996 he was appointed Head of Cabinet of Dr Martin Bangemann. From 2000 to 2005 he was Head of the Single Market Directorate responsible inter alia for automotive and pharmaceutical legislation. He was a Member of the Management Board of the European Medicines Agency (EMEA). Since January 2005 he has been in charge of the Directorate for Aerospace, Security, Defence and Equipment and has been appointed Coordinator for Aerospace, Defence and Security within DG Enterprise and Industry.
Before joining the European Commission he worked in the Cabinet of the Minister of Economics of Germany. He started his career at the Ministry of Economics working in the department dealing with East-West economic relations and competition policy. Mr Weissenberg was also posted to the German Permanent Representation to the OCDE in Paris and to the Chambers of Commerce in La Paz and Toronto.

11.2

Elisabeth Grieg (47) is a board member of Grieg International AS (since 1994) Mrs. Grieg is co-owner of the Grieg Group and CEO of Grieg International AS. She is a member of the founding family. In addition to being Deputy Chairman of Norges Rederiforbund, Mrs. Grieg is also board member of Star Shipping AS, Norsk Hydro AS, Det Norske Videnskaps- Akademi (Niels Henrik Abel Memorial Fund), NHO's Committee on Family Business, SOS Children's Villages Norway and Grieg Foundation. She is a member of Orkla ASA's Supervisory Board and Election Committee and the Council and Election Committee of Det norske Veritas.

11.3

Dipl.Ing **Georg Wilhelm Adamowitsch** studied landscape architecture at the Technical University in Berlin. He holds a master degree in engineering, as well as a master degree in administrative sciences of the German University of Administrative Sciences in Speyer. Mr Adamowitsch started his professional career as research assistance at the German University of Speyer, and pursued a career in the administration of the State of Nord Rhein Westfalen, leading to a position of Director General, responsible for the state planning agency. After a tree year intermezzo as commissioner for Federal and European Affairs at VEW AG he became State Secretary of the Ministry of Economics and head of the State Chancellery of Nord

Rhein Westfalen. Since November 2002 Mr Adamowitsch is State Secretary in the Federal Ministry of Economics. In this capacity he acts as federal coordinator for maritime affairs.

11.4

Dr Oecon Erik W. Jakobsen (38) is the Managing Partner of Menon, a research and advisory network. He also holds an Associate Professorships at The Norwegian School of Economics and Business Administration (NHH) and at Buskerud College. Jakobsen has his doctoral degree from NHH. He has substantial research experience both on the maritime and other industries. Jakobsen has written several books, most notably "Attracting the winners – the competitiveness of five European maritime industries", "A Value creating Norway" and "Who owns Norway – ownership and value creation in a borderless business world". Jakobsen's main academic areas are strategic leadership, organisation design, industrial economics and industrial policy.

11.5

Mr. Corrado Antonini, from 1974 Member of the Board and General Manager of Fincantieri Società Finanziaria Cantieri Navali, from 1985 Managing Director, from 1988 C.E.O., from 1994 Chairman and C.E.O., from 2000 Executive Chairman, now Chairman of Fincantieri - Cantieri Navali Italiani S.p.A.
Born in Rome 1934; graduated with honours in Law, honorary naval architect, honorary master in Business Administration, endowed with the highest Italian decoration for economic merits (Cavaliere del Lavoro) and other decorations in Italy and Finland, Columbus gold medal of the city of Genova, freedom of the city of Trieste. He is furthermore: Chairman of Euroyards, a European Economic Interest Grouping of six major European yards; Honorary Chairman and Member of the Board of CESA (Community of European Shipyards' Associations); Chairman of Assonave, the Italian Association of Shipbuilders and Related Industries; Chairman of Federazione del Mare, the Italian cluster of maritime activities; Chairman of Assindustria Trieste (Association of Industry of Trieste); former Chairman and now Member of the Council of AIAD, the Italian Association of Aerospace and Defence Industries; Member of the Council and Board of ASD (The European Association of Aerospace and Defence) and Chairman of the Naval Group (NDIG); Member of the Board of Assonime (The Association for Italy's Limited Liability Companies); Chairman of the Advisory Italian Committee of Lloyd's Register EMEA and Member of the General Committee of Lloyd's Register Holdings of London; Member of the International Council of Bureau Veritas of Paris; Member of the Council for Italy-USA relations.

11.6

Mr Mogens Schrøder Bech:
- Born 1948
- Msc(econ) 1974
- Head of Division

- Ministry of Economics and Business Affairs 19974 Several positions in the ministry and its authorities
- 1996 - the Danish Maritime Authority with the main responsibilities:
- Industrial policy - Shipping, the maritime cluster, transport in general and alignment with the overall industrial policy Copenhagen Business School 1978 - 2003 as part-time teacher.

11.7

Francis Vallat, 60, is currently chairman and president of both "L'Institut Français de la Mer" and " Le Cluster Maritime Français" . As such he is also vice-chairman of the "European Network of Maritime Clusters". Besides he is the representative of France and vice-chairman of the Board of the European Maritime Shipping Agency . Finally he is chairman of the Shipowners Insurance and Guarantee Company , an organisation which establishes the certificates of guarantee for all vessels entering American waters with pollutants onboard. In effect SIGCO covers 62% of the world fleet incorporating all sectors.
F. Vallat, basically a shipowner, devoted his entire professional life to shipping. He has been CEO of Van Ommeren Tankers, vice-chairman of Intertanko and a board member of numerous international bodies, a.o. the UK P&I Club. He has been known for years for his fights against substandard operators, and for his efforts to promote quality shipping.

Originating from Brittany, **Philippe Perennez** is a forty-year-old autodidact who has recently validated his professional carrier by completing a master degree in management of organizations.
Starting his carrier in 1988 at the bottom of the professional ladder as a technician at IBM's, he has become in 12 years head of department for national sales administration at NOOS. In 2000, he co-founds a company of commercial services and takes charge of finances, human resources and administration as General Secretary. Following a change in the shareholders structure of the company, he leaves it in 2003 (at that point of time, the company was employing 300 people) in order to go back studying. During his studies up 'till the beginning of 2006, he works as a consultant for SME. He is hired as the General Manager of the French Maritime Cluster in 2006. Since then he has developed, at an accelerated pace, a good knowledge of the French maritime field and has co-redacted the action plan of the French Maritime Cluster.

11.8

Mark Brownrigg is Director-General of the UK Chamber of Shipping and is responsible for the British shipping industry's relations with government and other relevant bodies (national and international). One of his principal roles in recent years was to co-ordinate the Chamber's pursuit of a positive national policy on maritime matters and the UK tonnage tax.

He helped found and directs Sea Vision UK, a cross-sector campaign dedicated to raising public awareness of the sea and of all maritime activities, embracing the UK maritime cluster in its broadest sense. He chairs its National Core Group. He also acts as co-ordinator for the UK cluster's informal discussion network, "Maritime UK".
Graduating from Cambridge University in modern languages and law, he joined the Chamber in 1972 and early in his career held positions as assistant to the Secretary-General of the European Community Shipowners' Association and as Secretary of the International Shipping Federation.

11.9

Drs. ir. Henk Janssens (1946) holds a master degree in civil engineering from the Delft University of Technology as well as a master degree in economics from Erasmus University / Municipal University Amsterdam, majoring in transport economics. He is managing director of the Dutch Maritime Network and secretary of the European Network of Maritime Clusters. He worked for 25 years in the private sector of which 20 years for stevedoring and transport firms in bulk and containeractivities worldwide. In his previous position as director transportation activities of the former Bell Lines - the European Short Sea door to door specialist - he was responsible for new terminals in the Netherlands, U.K. and Ireland; development of novel shipstypes, wide body containers and integrated transport concepts.

11.10

Prof.dr.ir. Niko Wijnolst (1946) holds a master and doctorate degree from the Delft University of Technology and is currently visiting professor in *Shipping Innovation* at universities in London, Rotterdam and Copenhagen. He is chairman of the Dutch Maritime Network, chairman of the Maritime Innovation Board, chairman of the European Network of Maritime Clusters, member of the European Commission's DG Research - Transport Advisory Group, supervisory board member of various maritime companies and a maritime consultant and researcher. He worked for ten years in the private sector with maritime companies and twelve years as part-time professor at the Delft University of Technology. He published many articles and (co-authored) 18 maritime books.

11.11

Prof. Dr. Chris Peeters is President-Executive Director of *Policy Research Corporation* and Senior Partner. He is a Professor at the University of Antwerp, where he lectures Government Policy and Maritime & Port Economics. He acts as a personal advisor for numerous public and private organizations worldwide, and he is author of more than 30 books concerning strategy and policy.
Prof. Peeters is an internationally renowned expert with respect to strategic and policy analysis. His research focuses especially on the development and implementation of successful policies, long-term vision and effective decision-

making processes in complex situations, beneficial reorganizations and the development of new markets. He has also been granted several scientific distinctions for his academic research studies (Email: info@policyresearch.nl).

Dr. Harry Webers is Manager at *Policy Research Corporation* and Member of the International Scientific Committee. Dr. Webers holds a Masters degree in Mathematical Economics, and received his Doctors Degree on the dissertation entitled 'Competition in Spatial Location Models'. He has extensive consulting experience through his involvement in and project management of many influential policy studies in fields such as maritime transport, economic policy, media, aviation, mobility. Amongst others Dr. Webers was project manager of the monitoring study of the Dutch maritime cluster. Dr. Webers is also (co-)author of some ten books and over thirteen articles in the different fields mentioned (Email: harry.webers@policyresearch.be).