Cyprus International Mobilization & Mutual Learning Workshop

Wednesday, April 11th 2018, 09:00-17:00
House of Arts and Literature, Larnaca, Cyprus

@Photo by mali maeder from Pexels

What Responsible Research and Innovation (RRI) actions are needed for sustainable Maritime Research, Technological Development and Innovation (RTDI) by 2030?

With the support of:

Maritime Institute of Eastern Mediterranean

Cyprus is the 3rd largest third-party ship management centre in EU:

Did you realise that Cyprus has the 11th largest merchant fleet globally and the 3rd largest fleet in the European Union? Under the Cyprus flag there are more than 1800 ocean-going vessels with 21 million tons of gross volume. The marine industry contributes with about €1 billion per year to the Cypriot economy, accounting for over 7% of GDP (including auxiliary services) and directly employing 4,000 shore-based personnel and 55,000 seafarers from around the world. Moreover, Cyprus and its Limassol Port is the 3rd largest third-party ship management centre in EU and the 5th largest in the world. It is estimated that 5% of the world's fleet and about 25% of global third-party ship management activities are controlled from Cyprus[1]. This means at an EU level, that if the third-party ship management centres of Europe, collaborate responsibly, they can become stronger at better face the global competition.

Positioning itself as the world leader in shipping, shipbuilding and marine equipment, it is unquestionable that the economic value of the European shipping industry is not negligible. Drawing from the results of the most recent study in this area (Oxford Economics 2017[2]), the European shipping industry offered employment positions to 640,000 people while contributed €57 billion to GPD as for the end of 2015.

Third-party ship management activities at global level:

The strategic position of Cyprus, as the only island in Eastern Mediterranean and the most eastern border of the European Union, has made it a maritime centre since antiquity. Today, it concentrates more than 130 third-party shipping management companies including the headquarters of many international players. The third-party ship management is a line of business that concentrates economies of scale facilitating the ship owners' responsibilities with services such as commercial operations, organising insurance, purchasing stores, technical maintenance, crewing the ships, as well as regulatory assistance. Competition between Ship Management companies is strong and this encourages research and innovation to stay competitive in the field. Furthermore, it requires a vast array of education specialisations, where universities and technical higher education establishments must train a highly skilled workforce[3]. Therefore, science education and open access to research results are becoming important.

A large number of ship-owning, ship-management, chartering and shipping related companies maintain well-developed offices and conduct their international activities from Cyprus. The vast majority of these companies are located in Limassol and are Members of the Cyprus Shipping Chamber. It is not surprising that the headquarters of some of the largest ship-management companies in the world, such as COLUMBIA Shipmanagement Ltd. and Bernhard Schulte Shipmanagement (Cyprus) Ltd., are located in Limassol where they also run their operations. It is estimated that approximately 5% of the world's fleet is managed from Cyprus. Among the ship-owning and ship-management companies established and operating from Cyprus, 90% are controlled by European and Cypriot interests[4].

1 http://www.cyprusprofile.com/en/sectors/maritime-and-shipping
2 http://www.ecsa.eu/images/NEW_Position_Papers/2017-02-27-Oxford-Economics-Update-2017---FINAL.pdf
3 https://www.maritimeinfo.org/en/Careers-Guide/ship-manager-2
4 http://csc-cy.org/cyprus-a-leading-maritime-center/

Larger and larger vessels:

The Mediterranean Sea is amongst the world's busiest waterways accounting for 15% of global shipping activity by number of calls and 10% by vessel deadweight tons[5]. Nowadays the size of ships has become enormous and the dimensions of the widest ships that sail in the Eastern Mediterranean are based for example on the width of the Suez Canal[6]. Cyprus can handle vessels up to 340m in length. The multipurpose Limassol port terminal handles almost 1 million tonnes of general cargo traffic and welcomes approximately 300,000 passengers per year. Overall, the Limassol port currently services on the order of 3,200 ships per year, including container, general cargo, cruise, *ro-ro* (roll-on, roll-off) and naval ships, using three tugs[7].

The size of the vessels, the complexity of shipping and the constantly upgraded regulations require strong and regularly updated third-party ship management in Cyprus to stay competitive. This does not only apply to Cyprus, but to the whole EU, as the Asian competitors are constantly up scaling. **But what advancements are needed in research and technological development to stay competitive? How can these technological developments become innovations and useful for the maritime sector?**

Will I have a job tomorrow? The robots are coming:
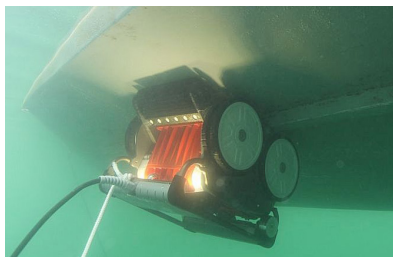
Robotics are entering industries around the world as driving forces to enable the development of future medicine and warfare, while assisting on better economy, and well-being. Maritime industry is not an exception considering that the robotisation has begun for jobs both at sea and on shore. For example, fire fighter robots are designed with a vision system to search for survivors under harsh circumstances while withstanding heat up to 500 degrees Celsius. They are additionally outfitted with multi-modal sensor technology for advanced navigation to overcome obstacles and stay upright even in pitching and rolling sea conditions. Another example relates to the Hull Cleaning Robots that will be capable of grooming the underwater portion of the ships resulting in higher fuel efficiency and reductions of carbon-dioxide emissions. Hull roughness management using hull cleaning robots can play a vital role in this regard[8].

While the benefit of integrating new technologies and robots in the shipping industry is widely understood among stakeholders as a means to eliminate for example marine casualties, the recently announced plans to develop unmanned and autonomous vessels could possibly account for new challenges[9]. Despite the fact that the introduction of unmanned vessels could be a reality within this decade reducing the crew costs and thus boosting the economic growth of the industry, potential impediments should be taken into serious consideration before these vessels are launched. What will happen if an engine malfunction occurs in the middle of the ocean and the operation of the vessel terminates until a team of engineers arrives and handles the incidence?

"Opaque, non-transparent and fragmented":

The maritime industry, being a transport chain, until now it has been "opaque, non-transparent and fragmented"[10] according to "Shipping Today". The maritime industry is changing as it is facing many

5 http://www.rempec.org/admin/store/wyswiglmg/file/Prevention/Maritime%20Study/Study%20of%20Maritime%20Traffic%20Flows%20in%20the%20MedSea_Unrestricted.pdf
6 http://maritime-connector.com/wiki/ship-sizes/
7 https://gettingthedealthrough.com/area/81/jurisdiction/74/ports-terminals-cyprus
8 https://www.marineinsight.com/future-shipping/5-innovative-robotic-technologies-for-the-maritime-industry/
9 http://www.bbc.com/news/technology-26438661
10 https://knect365.com/maritime/article/1149354e-68d9-4e74-9f91-a900ac869526/6-maritime-startups-that-are-changing-the-game

challenges, which are not only limited to environmental regulations pertaining the fuel of ships, digitalisation, global security and cyber threats.

The shipping industry today involves many middlemen as for example freight forwarders and logistics providers. However, this situation is starting to change. This was also the case with the aviation industry, which changed completely following the arrival of the digitisation era. Think about it: If we can book a flight with a few clicks, why can we not book container transport? If we, as the end customer, can follow and track the current status and location of the parcels that we sent, why not do the same for containers? The Internet of Things is moving also into the shipping industry. Many start-ups are eying the maritime sector and the first shakes are already under way. **Can we book a container with only 5 clicks?**

Such thinking would change the relation between consumers and cargo transport dramatically, but it would require a mind shift of shipping companies. And surely it will create business opportunities for the modern middleman: "the App"[11]. **Is the App the new middleman in the maritime industry**

Piracy is a big issue:

Pirates and treasure hunts are not something of the past. Many vessels and ship-owners are facing piracy as a huge problem while at sea, as for example on the East coast of Africa. Safety at sea is a big issue for the maritime sector today. Piracy, illegal activities, illegal migrants are some of the more important safety issues that a ship owner and crew must face. ***Do you think that ships should be armed?***

The knowledge is there, but where are the results?

The health of oceans is threatened by human activities such as pollution from ships, oil spills, invasive species from ballast water, air pollution from ship emissions, toxic substances in the water due to antifouling paints. Many EU projects have worked on these issues in the past 14 years. **But where are the results? Have they reached the market? How can we find these results and how can we use them?** *How can the Cypriot maritime industry become an example of reference for Europe?*

Last year during the Ocean Conference of the U.N., the world pledged on the Sustainable Development Goal 14 to "Conserve and sustainably use the oceans, seas and marine resources for sustainable development". This is also an important goal for the whole maritime sector.

The ocean has always brought wealth and opportunities. In the EU all these opportunities have been collectively called "Blue Growth" and sometimes also referred to as Blue Economy. The idea now is to develop and invest in the different marine sectors responsibly and use the ocean in a sustainable way considering the junction of economic benefits, ocean environmental health and societal values in policies and best practices.

11 http://shippingtoday.eu/middleman/

By focusing on societal challenges and combining purpose in innovation, competitiveness-productivity-profit and environmental impact, Ocean/Maritime Clusters can lead ocean sustainable development and gain economic benefits. Furthermore, some objectives of the Limassol Declaration[12] (Marine and Maritime Agenda for Growth and Job) confirm the relevance of the RRI principles in marine water management:

§22. Stress the importance of improved maritime governance including increased cooperation, at the appropriate level, among the competent authorities performing functions ensuring cleaner, safer and more secure seas and oceans;

§23. Improve planning transparency for investments and a balanced approach between relevant sectors and stakeholders, by deploying maritime spatial planning and integrated coastal zone management in Member States and in their cross-border areas, to ensure coherence with environmental, societal and economic objectives;

§24. Achieve or maintain good environmental status of marine waters by 2020, by continuing the effective implementation of the obligations of the Marine Strategy Framework Directive being the environmental pillar of the Integrated Marine Policy, including the development of a coherent network of marine protected areas, and implement the EU Biodiversity Strategy 2020;

§25. Implement suitable management, prevention and adaptation practices, in order to enhance the resilience of coastal areas, marine ecosystems and maritime activities, to the impacts of climate change;

Cyprus has taken the lead to define the above and it should continue. **How can the Cypriot maritime industry become an example of reference for Europe?**

The aforementioned issues will be addressed at the Cyprus international workshop: **"What Responsible Research and Innovation (RRI) actions are needed for a sustainable Maritime Research, Technological Development and Innovation (RTDI) by 2030?"** that aims at discussing the above challenges that the maritime industry is facing and define actions that will enable the maritime industry to become resilient, responsible and sustainable.

---

12 Marine and Maritime Agenda for growth and jobs"The Limassol Declaration". Cyprus, October 12 2012. Available at: http://ec.europa.eu/maritimeaffairs/policy/documents/limassol_en.pdf https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/body/limassol_en.pdf

Why is it urgent that the maritime sector becomes resilient, responsible and sustainable by 2030?

"Shipping Today" stresses that the maritime industry is undergoing and must undergo small and large changes. However, maritime actors meet these changes with scepticism and change is impaired. The main question is how can the maritime industry become resilient, responsible and sustainable?

The maritime sector involves many different actors and operators. As an example consider the range of actors involved in a simple procedure of shipping a container: land-transporter, ports and terminals, carriers, shippers, stevedores, surveyors, customs. How can these operations become more transparent?

Technological advancement and increasing environmental, safety, quality and economic regulations, push ship-owners to seek and take advice from professional managers for matters ranging from the correct marine fuels and ship engines, to crewing safety training, to new technologies for bio-antifouling. As compliance requirements increase, the move towards adopting an integrated fleet management system seems essential for many shipping companies looking to remain competitive in the market. For instance, in 2015 Maersk Line, the world's largest container shipping company, contracted third-party ship managers for the first time for managing 12 ships from the Maersk Line fleet for a period of five years. The services required cover crewing, technical operations, safety performance, environmental performance and energy efficiency. Another example is Masterbulk, the Singapore subsidiary of Westfal-Larsen Shipping based in Norway, which also announced plans to close its in-house ship management division in favour of seeking third-party ship managers for its own fleet. In early 2016 it was also reported that third-party ship management company V.Ships Shipping, part of the V.Group, had entered into a partnership arrangement with Empros Lines to provide technical management of dry bulk carriers in Greece. Third-party ship management may offer ship-owners with better operation systems which support better data collection and analysis through new ship management software covering the areas of technical management, dry-docking, procurement, document management, risk management, safety management reporting, crewing and BI/fleet analytics.

Apart from this growing worldwide interest in third-party ship management services, it's worth noting that, according to the *Baltic and International Maritime Council* (BIMCO), only about one-third of the entire global shipping fleet is currently under third-party management. This suggests that third-party ship management companies can expect to further capitalize on the growing business demand for their work and technical services in the foreseeable future.

The global societal trends and drivers are pushing and forming the maritime industry and by 2030 the world pollution is expected to reach 8.5 billion, an increase of 1.2 billion more people in 15 years! This puts the planet in an extreme pressure for food, water and energy. The waterborne trade is expected to grow even more due to the global demand for food, water and technological products. At the same time, the climate change will cause even more temperature extremes, higher and frequent storms putting the ships at even greater risks.

The shipping industry global operations are increasing and the environmental impact of shipping includes greenhouse gas emissions, acoustic, water & oil pollution. The International Maritime Organization (IMO) estimates that Carbon dioxide emissions from shipping were equal to 2.2% of the global human-made emissions in 2012 and expects them to rise 50 to 250% by 2050 if no action is taken. This relates to the UN Sustainable Development Goals (SDGs) adopted in 2015:

6 CLEAN WATER AND SANITATION   **9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**   **13 CLIMATE ACTION**   **14 LIFE BELOW WATER**

Ship breaking or ship demolition is a type of ship disposal involving the breaking up of ships for either a source of parts, which can be sold for re-use or for the extraction of raw materials, chiefly scrap. It may also be known as ship dismantling, ship cracking, or ship recycling. Depending on their size and function, pollution from burning scrapped ships is a major environmental pollution because 5,000 and 40,000 tons of metal, 95% of which is steel, is coated with between 10 and 100 tons of paint containing lead, cadmium, organotins, arsenic, zinc and chromium. This leads to serious coastal pollution, because the scrapped ships are on the beach! Ships also contain a wide range of other hazardous wastes, sealants containing PCBs, up to 7.5 tones of various types of asbestos and; several thousands liters of oil (engine oil, bilge oil, hydraulic and lubricants oils and grease). Tankers additionally hold up to 1,000 cubic meters of residual oil. Most of these materials have been defined as hazardous waste under the Basel Convention. In Bangladesh, ships containing these materials are being cut up by hand, on open beaches, with no consideration given to safe and environmentally friendly waste management practices.

This relates to the UN SDGs:

What are the key issues and challenges arising from the workshop?

Political:

Piracy: In order to combat the growing international threat of piracy, Cyprus has been one of the first countries to approve detailed legislation allowing armed guards aboard Cypriot-flagged vessels. The present absence of a complete international legal framework, unfortunately calls for private armed guards onboard more and more. Ship-owners, operators and managers have no further means of safeguarding their ships, cargoes and more importantly their seafarers. The consensus industry view still remains that, under normal circumstances, private armed guards are by no means recommended. However, in view of the current escalation, with most recently seafarers being executed, ship operators are often forced by cargo owners and charterers to retain all possible options available to deter attacks and defend their cargoes and crews against piracy. Without robust and effective counter measures, piracy will continue to threaten the safe passage of thousands of seafarers and thus make the use of important sea-lanes an unacceptable risk. In view of the increasing danger of ships being used or being a target for terrorist activities, the Department of Merchant Shipping attaches particular importance to maritime security. The International Ship and Port Facility (ISPS) Code has been adopted and has been effectively implemented. All ships under the Cyprus flag, as well as all port facilities in Cyprus have been duly certified as complying with the requirements of the ISPS Code.

Cyprus has become Europe's "watchdog" in the Eastern Mediterranean region. Cyprus has installed and operates a Vessel Traffic Monitoring and Information System (VTMIS), which has the full capability to monitor, process and provide information on maritime traffic that enters the Middle East border of the EU, with positive effects for the whole region in respect of illegal immigrants' traffic intercepting, reduction of accidents and protection of the marine environment. Also, Cyprus as Europe's Eastern Border constitutes a bridge of communication and cooperation between Europe and the countries of the Middle East.

For integrated maritime surveillance for a safer Mediterranean, six Mediterranean Member States[13] are already participating in a pilot project aimed at strengthening cooperation and information exchange between the national authorities responsible for maritime monitoring and surveillance. This will improve the coherency of maritime surveillance throughout the Mediterranean basin.

Economic:

Cyprus has created a sub-ministry of maritime sector as per 1 March 2018 and it believes that there is significant potential to increase the contribution of the shipping sector to the Cyprus economy beyond its current annual 7% of gross domestic product (GDP), and this will rely on the support of a dedicated deputy minister who is wholly devoted to shipping related issues[14].

In addition, integrated research efforts are to be taken following the Commission's intention to strengthen in line with the European Strategy for Marine and Maritime Research. In particular, it wishes to set up a major cross-thematic research mechanism which is specifically adapted to the Mediterranean basin;

The ratification Bill includes mechanisms that will allow the Flag State to effectively exercise its jurisdiction and control over ships that fly its flag by establishing a system for ensuring compliance with the requirements of the Convention, including regular inspections, reporting, and legal proceedings under the applicable law, as well as, ensure that ships that fly its flag carry a "Maritime Labour Certificate" and a "Declaration of Maritime Labour Compliance" as required by the Convention.

Social and Cultural:

Society's increasing expectations with regard to health, safety, security and the environmental impact of industry will lead to stricter regulations and require the maritime industry to improve in these areas.

13 http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A52009DC0466
14 http://www.cyprusprofile.com/en/news/view/natasa-pilides-appointed-cyprus-deputy-minister-of-shipping

Already the civil society and citizens are not willing to accept negative environmental and social impacts of economic activities in the maritime sector such as accidents, water pollution, and unsafe working conditions.

The expected increasing scarcity of qualified personnel will also motivate the sector to improve working conditions. Societal expectations will lead to the maritime sector becoming more socially and environmentally responsible by complying with stricter regulations and possibly by adopting voluntary standards. The impact of societal expectations related to health, safety, environmental and security on the maritime sector is moderate and will not fundamentally alter the sector's future prospects.

Technological:

Digitalisation and the introduction of robotics in many maritime operations as well as removing the "middleman" in cargo management are fields that technology is moving in.

Secure, Clean and Efficient Energy as well as green and integrated transport are areas that research and technological innovation are focusing on.

Smart vessels, fleets and ports: Waterborne transport will be an integral part of an efficient logistic chain. Connection with other transport modalities, or inland-waterway transport, will be seamless. Smart vessels will communicate with smart ports to limit congestion, waiting time and thus costs. Smart vessels will adapt their sailing speed to match harbour slots automatically. The question is how far are we from this reality?[15]

Legal:

An implemented network of inspectors checking the ships under Cyprus flag in world ports has helped the control mechanisms of the Department of Merchant to substantially improve with a direct impact on the number of detentions of Cyprus ships around the globe, in particular with regard to detentions for serious deficiencies. This improvement was particularly felt when the significant drop in detentions of Cyprus flag ships enabled Cyprus to enter the Paris and Tokyo Memoranda of Understanding on Port State Control "White Lists".

What really makes the Cyprus shipping tax incentives even more appealing is the fact that, with this recent approval by the European Union, Cyprus has in effect become the only "EU approved Open Registry". This means that, any EU and more importantly, non-EU, ship operator may benefit from this very competitive shipping taxation system and also be able to have a quality EU flag on their ships. Furthermore, by setting up therefore a shipping company tax resident in Cyprus and having a Cyprus flag ship either owned, managed or chartered, then the whole set of shipping companies based in third countries (non-EU flag ships) can also enter the new Cyprus competitive tonnage tax regime.

Environmental:

Maritime transport is responsible for about 90% of global trade and is considered the least environmentally damaging mode of transportation. Compared to land-based transportation and human activities, shipping is generally a minor contributor to marine pollution. The below list of issues is by no means exhaustive.

Oil Pollution: Discharging oil in the water can kill plants and animals by coating them with oil. Shipboard sources of oil pollution include engine room bilges, fuel tanks, bunkering operations, cargo loading and discharging, tank washings, and ballasting/de- ballasting accidents. Generally, oil or oily mixtures should not be discharged into the water. When these operations are necessary, these substances should only be discharged using special equipment. Advancement in R&I is required further here.

Noxious Liquid and other harmful Substances: Many chemicals are poisonous to sea life, so greater care should be taken before dumping any liquid into the water. Chemicals can also contaminate the fresh water drinking supply for humans and make fish unsafe to eat. Marine pollutants can be found in the International Maritime Dangerous Goods (IMDG) code. Accidental loss overboard of containers, especially those, which are known to contain marine pollutants, must be always reported to shore authorities. Greater ocean

pollution literacy and education of crew is necessary. Can Internet of Things and spatial monitoring help these aspects?

Sewage: It is any drainage and waste from toilets and urinals, medical areas like dispensaries and sick bays, and any locations that contain living animals. When untreated sewage is discharged into the sea, harmful bacteria and other disease-causing agents can spread, plants and animals can become sick, and the health of people who rely on seafood to eat or fresh water to drink is threatened. Having an approved sewage treatment system on board is critical.

Litter: Litter, especially plastic can kill animals when they become entangled or eat it. While the biggest source of coastal pollution is from people ashore, ships are also responsible for minimizing the impact of litter at sea. It is illegal to discharge all materials other than certain types of food and animal waste anywhere at sea.

Air pollution: Ships are among the lowest sources of harmful exhaust, but need to do their part in minimizing the pollution from their airborne emissions from burning fuel to run engines and generators. Greenhouse gases like carbon dioxide contribute to climate change, and sulphur oxide emissions and nitrogen emissions also pollute the air. The control of sulphur oxide emissions is a good example of current developments in maritime regulations. Globally, the maximum sulphur content for marine fuel is set to decrease from its present level of 3.5% to 0.5% as of 1 January 2020, when the new international standard takes effect. Within the Sulphur Emission Control Areas (SECAs), covering the North Sea, Baltic Sea and English Channel as well as most of the North American coast, the applicable standard is even more stringent, with a maximum sulphur content limit of 0.1% effective from January 2015.

The UN acknowledges that if the world is planning to keep up with the terms outlined in the Paris Agreement, the shipping industry must play a role in it. Research by Smith and Raucci et al. suggests that shipping is forecast to increase its greenhouse gas emissions, unless the industry is regulated.

A group of international shipping industry leaders will join forces at the 23rd session of the Conference of the Parties (COP23) to the UN Convention on Climate Change (UNFCCC) in November 2018 to drive industry ambition and action on exploiting opportunities presented by de-carbonisation.

With regard to safety and pollution prevention, Cyprus has fully harmonized its legislation with that prevailing in the EU. For implementing this, the Cyprus Maritime Administration is continually improving. Similarly, a network of inspectors of Cyprus ships has been set up at the most important ports around the world, which has contributed substantially to the increase of inspections of Cyprus flag ships. But there is no doubt that much more innovative solutions and training is needed in this area.

Capacity building and education:

Capacity-building for improved maritime infrastructure is required for:

- monitoring and data collection facilities, ocean observatories, sub-sea technologies and specialised research vessels, innovation and education;

- the development of integration between knowledge and observation data as well as the promotion of interdisciplinary research activities on cross-cutting themes (for example the impact of human activity on coastal and marine ecosystems or the protection and exploitation of marine biodiversity), including technology transfer;

- the promotion of synergies through a combination of different forms of funding both private and at regional, national and Community levels.

- developing international cooperation because the problems related to the oceans have a global dimension.

- the digitalisation of many of the shipping and maritime operations are needed to meet regulatory and societal requirements.

- Ocean awareness and cause-and-effect education is necessary for all staff.

Responsible Research and Innovation (RRI)

Responsible Research and Innovation (RRI) implies a transparent and interactive process where societal actors and innovators actively collaborate to co-create solutions, services and products that are socially acceptable, sustainable and resolve important societal issues. RRI focuses on how to make research and innovation more useful to the society and how to protect the environment at the same time.

The RRI Core Subjects are:

- Reflection on ethical and social impacts
- Aligning R&I with users and societal needs
- Engaging stakeholders in the R&I process
- Equality and transparency in information and communication, education and ethics.

Public Engagement:

With more than 400 million sea passengers a year travelling through European ports, passenger ships and ferry services have a direct impact on the quality of life of citizens in islands and peripheral regions. Therefore, the maritime industry and its activities have major societal impacts, where citizens and civil societies should be involved. The question is how.

Open Access:

The EU has a wealth of marine data that is currently unexplored. Small and Medium-Sized Enterprises could take advantage of the public marine data resources and generate value delivering specific services for their customers. The European Commission recognises the Blue Growth opportunities offered by the wealth of publicly-funded marine observation and data initiatives. To this end, the European Union has supported the establishment of several valuable marine data portals, freely providing marine data on a wide range of parameters as well as a range of data products (e.g. maps) covering all European maritime regions. However, a gap exists between what is available in those open marine data portals and what maritime users need in terms of types of data and data products[16].

Science education:

For EU and Cyprus to stay competitive, a strong workforce for tomorrow's marine and maritime industry, policy and research fields are needed. Thus, the European educational programmes and training in marine science and technology are important. Currently, dedicated marine science programmes account for less than 10% of higher educational (degree) programmes in Europe, although training relevant to marine scientific fields or applications are also included in broader disciplinary training programmes, e.g. environmental courses[17].

The marine and maritime sciences have a significant role to play in supplying high-quality graduates through training and initiatives designed to address the needs of industry, science and policy. In order to facilitate the envisioned growth and job expansion anticipated by the EU Blue Growth initiative, a skilled workforce will be required, comprised of graduates from many different levels of the educational system. Education and research are, therefore, central components of the blue growth strategy and it is recognized that training itself, and the delivery of high-quality graduate programmes, is part of the engine which drives innovation and technology development in maritime sectors.

---

16 http://eurogoos.eu/2016/07/18/marine-information-workshop-industry-publicly-available-resources-innovation-blue-economy/
17 http://www.marineboard.eu/marine-graduate-training

Ethics:

Ethics in the maritime industry spans over several areas from fair employment, human rights at sea and on shore to the "right practices" for sustainability. An interesting view to be discussed is viewing Ethics together with sustainability. As sustainability has expanded into a concern for social and economic justice as essential factors in a stable and vital web of life. As a consequence, there are increasing connections between the fields of ethics and sustainability. In general there is lack of focus on ethics in maritime university programmes. Only about 27% of universities offering maritime related course contain ethics as such[18].

Governance:

Evidence for systemic failure in the governance of the maritime sector is clear from the widespread inability of many shipping policies to address the problems of environmental, security, safety and economic concerns central to the sector. The causes of this failure in governance and policy-making stem to a large extent from the unstoppable spread of globalisation, which has accelerated in recent decades and aggravated the shortfalls of the shipping industry. In particular, the substantially changed role of the nation-state as a maritime authority and policy-maker has generated friction between shipping as a truly globalised industry and the nationally defined legislative and governance authorities[19].

In Europe, the Integrated Maritime Policy seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas. It focuses on issues that do not fall under a single sector-based policy e.g. "blue growth" (economic growth based on different maritime sectors). Issues that require the coordination of different sectors and actors e.g. marine knowledge. Specifically it covers these cross-cutting policies:

- Blue growth
- Marine data and knowledge
- Maritime spatial planning
- Integrated maritime surveillance
- Sea basin strategies
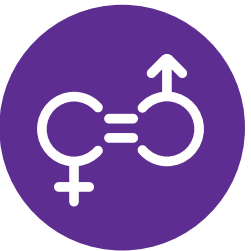
Gender Equality:

Gender inequality is deep in the traditionally male-dominated maritime industry, where women make up a mere 2% of the workforce. Although the maritime industry has adopted initiatives towards closing the existing gender gap, the integration of women into the maritime industry has been at a sluggish rate due to various impediments. Some of the factors for gender imbalance are due to historical roots but also to unique issues of the maritime industry towards achieving gender equality in its workforce.

The International Maritime Organisation (IMO)'s programme on the Integration of Women in the Maritime Sector (IWMS) has a primary objective to encourage IMO Member States to open the doors of their maritime institutes to enable women to train alongside men and so acquire the high-level of competence that the maritime industry demands. The IWMS programme includes but is not limited to, strengthening national and regional capacities through gender-specific fellowships; facilitating access to high-level technical training for women in the maritime sector in developing countries; and facilitating the identification and selection of women by their respective authorities for career development opportunities in maritime administrations, ports and maritime training institutes[20]. The program is called "SDG 5: Strengthening the maritime sector" nowadays, signalling the compromise of IMO with the post-2015 agenda and the SDGs. The main objective of the program is to facilitate access to high-level technical training for women maritime officials (IMO, 2016a).

18 https://www.polyu.edu.hk/lms/icms/research_maritimeInsight/2013-Dec-en/MARITIME%20INSIGHT_DECEMBER%20ISSUE(11).pdf
19 Michael Roe, Maritime Governance and Policy-making: The Need for Process Rather than form, The Asian Journal of Shipping and Logistics Volume 29, Issue 2, August 2013, Pages 167-186
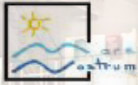20 http://www.imo.org/en/MediaCentre/HotTopics/women/Pages/default.aspx

Consiglio Nazionale
delle Ricerche

Coordinator

CONSIGLIO NAZIONALE DELLE RICERCHE (CNR), Itália
Fernando Ferri: fernando.ferri@irpps.cnr.it
marina.pro@irpps.cnr.it

Partners

ISPRA
Istituto Superiore per la Protezione
e la Ricerca Ambientale

PRO CONSULTING

world ocean
network

Science Centre
AHHAA

SMARTBAY
IRELAND

APRE
Agenzia per la Promozione
della Ricerca Europea

T.C. İSTANBUL ÜNİVERSİTESİ
1453

cic
nanogune

Nausicaá
La Mer est sur Terre

CNTI

AALBORG UNIVERSITET

eur@cean

CNTI

✕PRO

To confirm your participation, contact
Andreas Andreou - andreas@cnti.org.cy or register online here