GreenShip

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Abstract - Why? Background of project - A global approach for the development of energy efficiency systems including an effective emission control is led by the IMO on account of the continued rapid growth of the world trade in the maritime transport. (IMO, 2012). According to GL (2012), IMO has mandated certain measures related to energy efficiency in international shipping namely, Energy Efficiency Design Index (EEDI) which mandates energy efficiency standards for new ships; Energy Efficiency Operational Index (EEOI) to provide a tool for measuring the ship's fuel efficiency in operation and monitor the effect of any variations e.g. more frequent propeller cleaning or improved voyage planning or introduction of technical measures such as a new propeller or waste heat recovery systems; and Ship Energy Efficiency Management Plan (SEEMP), a management tool for ship owners. These three standards came into force on January 1, 2013 within a new chapter of MARPOL Annex VI. Complex technologies will be involved in building a ship efficiency and emission control system by the marine suppliers bearing in mind the life expectancy of vessels which is estimated to be around 30 years and also of the mandatory regulations to be met as set by IMO (Ziarati et al, 2017, 2018, Oceana 2013).
What? Objectives - Currently there is no standard for the proposed role of the Emissions Management role as proposed by the International Maritime Organisation (IMO). This project proposes the development of an Emissions Management job specification and a training programme for it specifically for the shipping industry to be able to continually improve its energy and emissions management on board ships with the view to save energy, reduce pollution and to improve the overall quality of energy and emissions management. The intention is also to encourage shipping companies to seek international standards such as ISO 50000. The intention is to use the IMO TTT ship energy efficiency materials developed (www.mariems.com) by some of the partners in this proposal expected to make ships energy efficient. The proposal will review ship emissions monitoring and management with regards to ship types, ship propulsion systems, ship navigation equipment, energy production units, electrical and mechanical parts and circuitry, safety issues, national certification, accreditation and validation of learning materials, pedagogical aspects of learning and last but by no means least online application.

Who? Number and profile of participants – the partnership is composed on an organisation (C4FF) with unique knowledge of energy production and engine emissions, the project team has considerable experience of training programme development and their validation and recognition internationally. C4FF are supported by two Maritime Education and Training

(MET) providers (SAMK in Finland (North); and UPC in Spain (West) covering the periphery of the Europe to ensure multiplier activities reach as many as countries in Europe as possible. The partnership is complemented by IDEC and CET to make sure the training programme takes all practical aspects into consideration. SPIN in Slovenia has been invited into the partnership to support C4FF in the development of several novel online e-learning platforms similar to the one developed by SPIN and C4FF in previous EU funded projects such as EGMDSS and MarTEL see their European maritime platform www.marifuture.org for all their projects: many of the projects by the partnership has been selected as 'Best in Europe' by the EU. Through its double role, both as educational provider and as management consulting company, IDEC is able also to incorporate best practices from the business sector, helping the partnership to develop open, sustainable and accessible education outputs for all.

Project Description

Priorities and Topics

The EU 2050 objectives set some intermediate targets for Eco-Efficient Vessel Emission Reduction for key pollutants: CO2: >80% (-30% by 2020), NOx: 100% (-80% by 2020), SOx: 100% (-80% by 2020) and Noise Reduction: -3dB. A review of current research (Ziarati et al, 2018) clearly shows that the targets set for 2020 won't be achieved and the 2050 goals are also unlikely to be achieved. The industry clearly needs help.

Maritime Trade accounts for approximately 90% of trade in the world today. About 1000 million tonnes of CO2 (and half as much NOx) have been estimated to be emitted from the international shipping (Ziarati et al, 2018) and it is expected to grow by 200% to 300% by the end of 2050, in the absence of any meaningful regulations - IMO GHG study, Buhang et al (2009). IMO has introduced some limits but is unable to monitor ship emissions. Discussions with industry (EU funded MariEMS and IMO TTT Projects for instance) has indicated a lack of understanding as to how some reported emissions reduction measures can be implemented by ship company managers and their crews. The Industry is taking steps to reduce its air pollution and carbon footprint due to recent and upcoming regulations and they need help in identifying key learning outcomes for their personnel and ship crews.

A skill gap has emerged between traditional Maritime Education and the needs of the industry and seafarers need to be able to apply increasing complex regulations and technologies in the name of reducing harmful emissions, and so this proposal is about designing the first training specification, training programme, and online delivery platform for the Emissions Management Role thus ensuring that EU Maritime Education providers can train their Cadets, and already qualified seafarers (as part of their continuing career development (VET), effectively to the new skills levels required by the industry. By making the Maritime Education and Training (MET) more relevant to the new market needs, EU through this project will make a serious attempt in closing the indentified gap in the skills in the shipping industry.

Although this proposal will focus mainly of the horizontal priorities of supporting individuals in the maritime sector acquire and develop key competences to make them more relevant to the labour market needs in terms of updating their education and training, by providing our GreenShip training programmes not only as training for new Cadets but also as part of continuing VET for already qualified seafarers, these are not the only priorities the proposal addresses.

As well as designing the training specification and programme, this proposal would lead to the development of an e-learning delivery platform allowing cadets and seafarers to access the training programme and learning materials over the internet – at any time and wherever they are. This is particularly relevant in the Maritime sector where seafarers are highly mobile and have less opportunity to take long face-to-face training courses whilst they are working.

Project Description

Please explain the context and the objectives of your project as well as the needs and target groups to be addressed. Why should this project be carried out transnationally?

It is accepted by that 90% of world trade happens by sea; as a result it is not surprising that in 2007 the global shipping industry is estimated to have emitted 1,046 million tonnes of CO2, 3.3 percent of global emissions, and in 2010 reached a total of 8.4 billion tonnes of goods loaded. The IMO's own International Shipping Facts and Figures report 2012 stated the number of propelled sea going vessels across the globe of at least 100 Gross Tonnage was 104,304, with cargo carrying vessels being 55,138. The EU 2050 objectives set some intermediate targets for Eco-Efficient Vessel Emission Reduction for key pollutants: CO2: >80% (-30% by 2020), NOx: 100% (-80% by 2020), SOx: 100% (-80% by 2020) and Noise Reduction: -3dB. A review of current research (Ziarati et al, 2018) clearly shows that the targets set for 2020 won't be achieved and the 2050 goals are also unlikely to be achieved. The industry clearly needs help.

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As the regulations and technologies governing Energy Efficiency on board ships become more complex it's been recognised by the IMO and the Industry that seafarers need to be trained to a much higher level in these fields. To this end, the IMO created the new role of "Energy Manager" - a role that must be filled on every sea going vessel, however that position alone is not enough. There needs to be a position specifically for managing, checking and controlling a ship's emissions of gases harmful to the human health and the environment, an "Emissions Manager". As this is going to be a brand new position there is no job specification, and no training specifications for this role and existing crew members have to learn 'on the job' how to implement these regulations as best they can. This is not an effective method of applying these regulations and will of course mean that the best results are not being achieved.

The purpose of this Partnership is the development of an emission management job and training specification, and the development and implementation of an online leaning and assessment system for the new training programme so that current Cadets, as well as existing seafarers, can up-skill themselves to the new regulatory requirements.

The partners are seeking EU funding for this proposal in order to bring together a unique blend of industrial, academic and SME partners who can bring to the table valuable and necessary experience in ship types, ship propulsion, ship navigation, energy production, electrical and mechanical parts and circuitry, safety issues, national certification, accreditation and validation of learning materials, pedagogical aspects of learning and last but by no means least online application. No single institution has expertise in all these fields and without all of this expertise the project outputs would not be sustainable as they would not reflect industry and academic needs, the latest trends in e-learning as well as being submitted to professional international recognition by awarding, accrediting and licensing bodies for accreditation.

As the maritime industry is global, creating a standard job and training specification across European countries as well as a full training programme to be submitted for international approval to the IMO and professional bodies, we would be taking the first steps to help support IMO and the EU achieving their stated emission targets through better management of energy on board vessels.

What results are expected during the project and on its completion?

A job specification in line with the current IMO regulation - A complete on-line and professionally accredited training programme on emission management systems and equipment used on board commercial vessels for the crew; the programme will embrace best practices in energy efficiency and green shipping operations. An online training manual for the teachers of the developed training programme so that it can be picked up by training organisations other than the project partners. Accreditation will be by a major and

internationally recognised accreditation body supported by individual accreditation by maritime institutions in the partnership.

In what way is the project innovative and/or complementary to other projects already carried out by the participating organisations?

The GreenShip partners have already developed a series of successful comprehensive e-learning and e-assessment products for the maritime sector (see www.martel.pro, www.egmdss.com) and a number of novel learning packages (see www.maritimetraining.pro) and in a previous project MariEMS; a job specification and a training specification for ship officers and cadets on ship energy management. These platforms have a combined user list of over 30,000 and have been acknowledged by the EU as 'Best in Europe'. The partners involved in those projects will take the skills and knowledge they have developed and apply them to the design and development of a tailored-made e-learning platform for the Maritime Emissions Manager training programme.

One of the major focuses of the EU Innovation Union is on energy efficiency and harmful emissions management as a stated cause of concern for EU citizens. As per the definition of Innovation in the Innovation Union this project seeks to facilitate and speed up the introduction of qualified emission managers on board ships through the development of a standard job specification, training specification and course along with an e-learning delivery platform. This will improve the way ships are managed introducing a continuous means of evaluating energy production and monitoring with a view to eradicate wasteful means of producing, converting and managing energy on board ships thus reducing the production of harmful pollutants.

The partners intend to transfer the best practices learned from these successful projects and apply them to a new area of 'Emission management operational practices', which is being promoted by progressive shipping companies, ports and bodies such as IMO. As this is a new innovation area there is no standard for emission monitoring and management and no training materials for it. To this end, the project intends to be the first mover in developing a training programme, online delivery platform and sample training materials for ship emission management in line with the current EU and international regulations. These outputs will be made available to EU METs, and will also be presented to the key maritime and shipping conferences such as IAMU, IMLA and international bodies such as EMSA and IMO as was the case for MariEMS for endorsement/approval and possibly as the basis for a new Model Course for the Ship Energy Management which could be applied by METs globally.

Thus the innovative characteristic of our project is to develop the first European specifications for the Emissions Manager position, as well as developing the standards and specifications for the training programme for that position, and the specifications and first online delivery platform for this training programme and materials. The skills shortage that is currently emerging between traditional education and the latest technologies,

requirements and practices for maritime energy efficiency and emission management needs to be addressed urgently in order for cadets and seafarers to have the skills necessary to implement the latest regulation and technologies to their best effect and thus secure the energy efficiency and pollutant reduction needed to help the EU meet its 80% reduction of CO2 and 100% reduction of NOx and SOx targets by 2050.

Another innovative characteristic of this project is the involvement of the Maritime/Shipping Industry in the formation of training programme right from the specification stage. Most training programmes are already so well established that any industry involvement is in making adjustments to already existing standards and curricula. However, as the Maritime Emissions Manager Role is entirely new, then the team of project partners has the opportunity to embed the industries requirements into the training courses right from their development stage. Also with industry involvement in the design and development stage of the training programme come the ability to accurately tailor the training programme to the current skill and knowledge level of seafarers working in the industry. This will ensure that those who take the Emission Manager Training Programme will have a course that is suited to them and reflects their current professional knowledge and experience, this giving the seafarers the best chance of success.

Being able to design these specifications, training course and online delivery platform from scratch in what is a brand new educational area means that the project partners would have the opportunity to be the world leaders, and can arrange to have the project outputs submitted to, and potentially recognised by, International Regulators (the IMO) and professional awarding, accrediting and licensing bodies (for example IMarEST). This would mean that the course would be internationally recognised, and reflect the needs of industry right from the beginning - giving MET institutions, all around the world, a blueprint to work from, ensuring that all cadets and seafarers are trained to the same standard, and consistently to implement these important emission efficient measures around the globe.

How did you choose the project partners and what will they bring to the project? Does it involve organisations that have never previously been involved in a Strategic Partnerships project?

The majority of the project partners have previous experience of working in EU funded projects whether it is through Leonardo Lifelong Learning Projects, Framework 7 projects and/or others, and several partners have also cooperated with each other previously as part of these projects. Bearing in mind these previous experiences, the GreenShip partners have been carefully chosen based on their relevant experience and skill sets, their ability to deliver the project outputs, and their ability to cooperate and work with each other in a cohesive and productive manner. Within the partnership there are 4 Maritime Universities, 4 Businesses of which 3 are ICT and e-learning specialists and 1 are industry representatives.

Each partner is a national centre with unrivalled links to its shipping industry and selected based on its area of expertise in one of the following areas: operation of different ship

types, ship propulsion systems, ship navigation systems, energy production, electrical and mechanical parts and circuitry, safety issues, national certification, accreditation and validation of learning materials, pedagogical aspects of learning and knowledge of training programme accreditation.

The MET partners in the project are dispersed across the EU and so are ideally placed to act and support GreenShip to bring national experiences and requirements from across the EU to the project, and to disseminate the project across the EU. The day-to-day activities of the METs are directly in line with the goals of the GreenShip project viz., to design and deliver materials and courses to educate seafarers to new regulatory requirements and to increase their capacity through innovative use of technology and e-learning solutions. The MET partners also have strong links to international regulators such as the International Maritime Organisation (IMO), to international awarding accrediting and licensing bodies such as IMarEST, and to Industrial companies and their key decision makers. These networks are keys to the long-term sustainability of the GreenShip outputs and the training programme and e-learning platform; the programme will need to be internationally recognised by the regulators, the awarding bodies and Industrial companies in order for other (non-partner) METs to be attracted to running GreenShip programme, and for seafarers to choose to enrol on them.

All partners have been selected as they reflect the industry and can give first hand information as to the current skills levels of seafarers in applying the energy efficiency regulations. If the IMO requirements are to be met all ships must have an Ship Emission Manager, CETENA as a ship support company have firsthand experience of manning and running ships at sea and in trying to implement these new Energy Efficiency and ship emission regulations with the limited staff expertise and training currently available in the industry. Cetena will be one of the end beneficiaries of the project and so have an invaluable insight.

The 3 private SME companies involved in the partnership (C4FF, SPIN and CET are experts in developing e-learning platforms and solutions and have many years of experience in this field creating platforms such as EGMDSS (http://www.egmdss.com/en/), MarTEL (www.martel.pro) and several others. One of the SME partners is also the founder of the MariFuture network (www.marifuture.org) which is a pan-European network for Innovative MET research and development; members of MariFuture include: companies, universities awarding bodies, accrediting institutions, licensing authorities and government agencies. Therefore the experience of the 3 private company partners in participating in EU funded projects, their knowledge and skills in the development of e-learning solutions and platforms, and their networks within Industry, regulators and awarding bodies, policymakers, and METs mean that they are ideally placed to contribute to the success of the GreenShip project.