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# INCAMP: MASTER'S DEGREE IN THE CARBON NEUTRAL MANAGEMENT OF SPORT MARINAS

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## Abstract

INCAMP project is developing an International Master's Degree in the Carbon Neutral Management of sport marinas. In this article we present a draft on the distribution of the Master, with main learning materials that will be taught. The content has been divided into paths, modules and subjects, as following: 6 Fundamental modules; 18 Subjects; Practical and a Dissertation. Subjects of the Master has been selected to give the appropriate knowledge to the future students interested in Carbon Neutral Management of sport marinas. INCAMP has been created to meet future skills needs and to enhance the opportunities for cooperation between Higher Education, Vocational Educational Training and Industry, providing opportunities for cooperation among stakeholders as well as the exchange and transfer of knowledge to increase know-how.

Throughout the master, students will be taught to understand and investigate the major processes and change drivers which contribute to climate conditions in the earth system at different scales, among them, the understanding of the interdependencies between the grand cycles (water, carbon, nitrogen, phosphorus) in the Sport Marinas Management System. Furthermore, they will analyse the roles played by the biosphere in global and local environmental change: how is it affected by environmental change and how can changes in the biosphere affect global change? A macro-scale view of global biosphere function in Earth history and the global impact of humanity, putting contemporary environmental change into wider context. Human systems of knowledge, values, organization, technology, and behaviour will be examined in relation to environmental change in an evolutionary and social development context. What is the utility of viewing human societies as systems? How do the complexity, diversity, stratification, and resource management strategies of human societies shape their contributions and responses to critical environmental parameters and challenges? The module introduces relevant cognitive, social, economic, and human ecological concepts and theory to understand historical developments in social-ecological systems and address contemporary issues of sustainability and wellbeing in an increasingly populous and globalised society. Specifically, the students will investigate the role of energy systems in causing and mitigating climate change for carbon neutral management of sport marinas. Debates and major trends in the role of technologies, economics, human behaviour, social change and governance in avoiding dangerous anthropogenic climate change.

Keywords: carbon neutral, marina, master, high education, innovation.

## 1 INTRODUCTION

Maritime transport emits around 1000 million tonnes of CO<sub>2</sub> annually and is responsible for about 2.5% of global greenhouse gas emissions (Smith et al., 2014). Shipping emissions are predicted to increase between 50% and 250% by 2050 (Fig. 1) depending on future economic and energy developments. For nautical boats the "end of use" is one of the main challenges for the industry which poses a threat to the environment and a recycling challenge.

Staff qualifications, the inability to attract young workers remain one of the crucial points in Europe. To boost the recruitment of highly prepared staff requires initiatives addressing learning to make the Environment management and security related sectors attractive and to transform both the academic

knowledge and high-level basic and transversal competences to be useful and applicable (INCAMP, 2019).

INCAMP arise from a Strategic Partnership composed of higher education institutions and SMEs that actively cooperate among themselves and key stakeholders (enterprises, regional bodies and other HE/VET institutions) that resulted in the development of an International Master Module programme for Carbon Neutral Management of Sport Marinas. The Master programme offer an adapted curriculum to equip the young generation with the specific, basic and transversal competences currently required in the planning, climate change mitigation and vested industries. This international Master's Degree Modules Programme is in line with the targets identified by the 2011 EU modernisation agenda. The developed curriculum attuned to current labour market needs of modern society will provide opportunities for students to gain additional skills through study and training abroad. Such approach is hoping to attract young people into Higher Education. All partners in the consortium are in regions which are highly influenced by the climate change and are actively involved in research and innovation initiatives, which will strengthen the links between education, research and business in order to promote excellence and regional development.

This initiative complies with one of the principal aims of the Erasmus+ program: Promoting synergies and cross fertilisation throughout the different fields of education, training and youth, removing artificial boundaries between the various actions and projects formats, fostering new ideas, such as a sectoral multi campus, promoting cross border cooperation by attracting new actors from the world of work to collaborate with universities and VET, but above all, with the target of stimulating new forms of cooperation.

As a first approach, this Strategic Partnership has focused the master's modules content in those relevant and high-level basic and transversal competences required in the sectors that carbon reduction targets have a major impact. This includes planning (having strong emphasis on eco-design and end of life recycle), resources management and green materials, as well as processes and technologies in the boating industry sector. The second approach to this Master Programme will also address those basic and transversal competences needed in these sectors: Eco-innovation, business continuity, technical surveillance, industrial property, competences in foreign languages and Information and Communication Technology (ICT) tools.

INCAMP's approach aims to recognise and validate the competences and skills acquired by making use of the ECTS instrument and National Qualification Frameworks of the participant countries. ECTS (European Credit Transfer and Accumulation System) *"is a tool of the European Higher Education Area for making studies and courses more transparent. It helps students to move between countries and to have their academic qualifications and study periods abroad recognised. ECTS enhances the flexibility of study programmes for students. It also supports the planning, delivery and evaluation of higher education programmes"* (European Commission, 2015). These will equip future and current youth workers from these traditional sectors with all skills and competences currently needed to deliver high quality products and services to boost competitiveness of the EU security sector with main emphasis on environment.

INCAMP was designed with the aim to support the development and the implementation of an innovative practice, a new training path in the planning sector, anticipating the followings results:

- The development of specific, basic and transversal competences and skills relevant for the boating industry, such as management, entrepreneurship, leadership, digital skills and language competence in the field of education and training, through pedagogical approaches developed in the different intellectual outputs.
- The intellectual outputs obtained will strengthen the education and training paths of youth workers, equipping them, in this case, with all necessary competences and skill to attain a high-quality job in the environmental related sectors.
- The online learning content will support teachers and educational staff and youth workers in acquiring or improving the use of ICT for learning and related digital competences.

INCAMP will trigger modernisation and reinforce education aligned to the needs and opportunities offered by traditional industries. It will provide, assess, and look for the recognition of basic skills needed in carbon management, waste and energy management, transport and logistics management. INCAMP will also address transversal skills, such as entrepreneurship, foreign languages and digital competences.

## 2 METHODOLOGY

The programme Master of Science Modules in Carbon Neutral Management of Sport Marinas aims to:

- Examine the nature, causes and impacts of major types of environmental change, and how these changes operate and interact on global, regional and local scales and in relation to critical social, physical, and ecological systems.
- Engage the economic, legal, cultural, and ethical underpinnings of environmental responsibility and systemic solutions, including mitigation, adaptation, remediation, enhanced resource stewardship and other sustainable responses to environmental change at different scales and within different organisational contexts.
- Facilitate a critical appreciation and understanding of the science underpinning carbon neutral sport marinas management and the social science and ethical roots that inform human behaviour.
- Empower Sport Marinas Managers with the analytical and practical skills, integrity and broad appreciation of management systems and societies in relation to carbon neutral concept necessary to address the world's most pressing environmental problems.
- Provide an entry-point for those who wish to go on to further advanced research, policy, academic business, NGO or other environmental leadership work.

Students will develop a knowledge and understanding of:

- The key concepts of earth systems, ecosystems, and human systems in relation to environmental change (e.g., the Anthropocene).
- The theoretical and practical basis for human adaptation, development, governance, sustainable decision-making, energy production and demand, natural resource management, and climate policy,
- Techniques for understanding carbon neutral management of sport marinas through assessment, modelling, valuation, remote sensing, field studies and monitoring.
- The key research skills and methods of analysis for integrated marinas management assessment, strategic planning, measuring sustainability, and evaluating policy in response to environmental change.
- The intersecting issues involving climate, energy, biodiversity, water, and food security in the present and future.
- Specialist topics consistent with candidate's interests and the expertise of the School.

The importance of interdisciplinary approaches in the solution of marinas management problems is a major theme in this Master programme. INCAMP takes a problem-based approach to interdisciplinarity through key environmental management issues. The course is structured to enable students to develop their own interdisciplinary thinking. At the Master level, it is appropriate that students are given the opportunity to explore diverse literatures, approaches, and issues concerning environmental change and management. Capstone and other integrative exercises within and across various modules provide students with opportunities to do this in groups as well as individually.

Therefore, the proposed Master Degree in the Carbon Neutral Management of Sport Marinas will contain, is composed of the following modules:

- Module 1: Basic Area

In the first module of the Master, the aim will be covering introductory knowledge that is common in all activities in the maritime field. In the basic area there will be general contents related to research, maritime economy and introduction to maritime sector terminology.

- Module 2: Management Area

In this module the students will study the ports from a business point of view. Therefore, the knowledge of this category will allow them to have access to a general, but clear information about marketing, business and organization strategies.

- **Module 3: Juridical Area**

Regarding the Juridical Area, students will learn about the international maritime law and the international institutions involved in shipping and maritime affairs. This will provide a general vision in maritime legislation. Furthermore, contents about environmental law focused on port management will be provided. Finally, specifically the legislation in maritime safety will be studied as well. The main objective of this area will be to obtain knowledge of current maritime legislation and its relationship with ecological law regarding port management.

- **Module 4: Operational Area**

In the Operational Area we will learn about maritime logistics and onshore works such as services provided by a port and management of port terminals. This area is key in detecting opportunities where a more sustainable management can be carried out both onshore and offshore.

- **Module 5: Ecological Area**

The last two modules of the Master will be “green modules”. In the “Ecological Area” the students will learn about sustainability and environment, and in the “Carbon Neutral Area” they will approach to the concept of carbon neutral management itself. Therefore, in this module, matters such as ecological models, including the concept of resilience, will be introduced, all discussed in the context of scientific topics on natural limits such as resource consumption, pollution, carbon dioxide and climate change.

- **Module 6: Carbon Neutral Area**

This is a module that distinguish this Master from other Port Management Masters, due to the implication of the sustainability and the carbon neutral impact in the marina’s management. The Carbon Neutral Area will start by studying the impacts on the ocean caused by the human being. After that, the focus will be on the onshore facilities and the alternative fuels and technologies we have nowadays. They will finish the module by learning how to calculate the carbon footprint and the ways in we can mitigate or reduce it.

The practical part will consist in a traineeship period undertaken in a company located in a different country from where the student is doing the Master. In order to be able to access the internship period, students must first have satisfactorily completed all the modules of the master's degree.

Once all the modules have been completed and the internship period is over, the student will have to do an individual dissertation about a topic that must be approved by the home university. The dissertation provides an opportunity for developing ideas or applying solutions to current port management issues. Every student will have an individual tutor who will lead the student until the end of the project. The student will prepare a dissertation (including index, bibliography and annexes) of 15,000 (maximum) word. All dissertations will be judged on the degree to which they represent a logical, thorough, and intelligible report on a piece of original research, of a standard expected of a Masters student.

The Methods and Techniques in Sport Marinas Management introduce cross-cutting, multidisciplinary methods and techniques for addressing environmental change issues, as introduced throughout the core lectures, readings, field courses, workshops and other media. Beyond the many methods and techniques introduced throughout the course, students are also encouraged to pursue innovative and mixed method approaches to sport marinas management and carbon neutral management of marinas problems through the elective programme, dissertation projects, and other outlets, as appropriate. A quantitative skills module is offered to ensure students have requisite techniques for interdisciplinary environmental science.

## **3 RESULTS**

### **3.1 Appendices**

#### **3.1.1 Abbreviations and Acronyms**

- BAU: Business as Usual
- CO<sub>2</sub>: Carbon Dioxide

- ECTS: European Credit Transfer and Accumulation System
- GHG: Greenhouse Gas
- HE: Higher Education
- ICT: Information and Communication Technology
- IMO: International Maritime Organization
- INCAMP: Carbon Neutral Management of Sport Marinas International Master Modules Programme
- NGO: Non-governmental organization
- VET: Vocational Education and Training

### 3.1.2 Figures and Tables

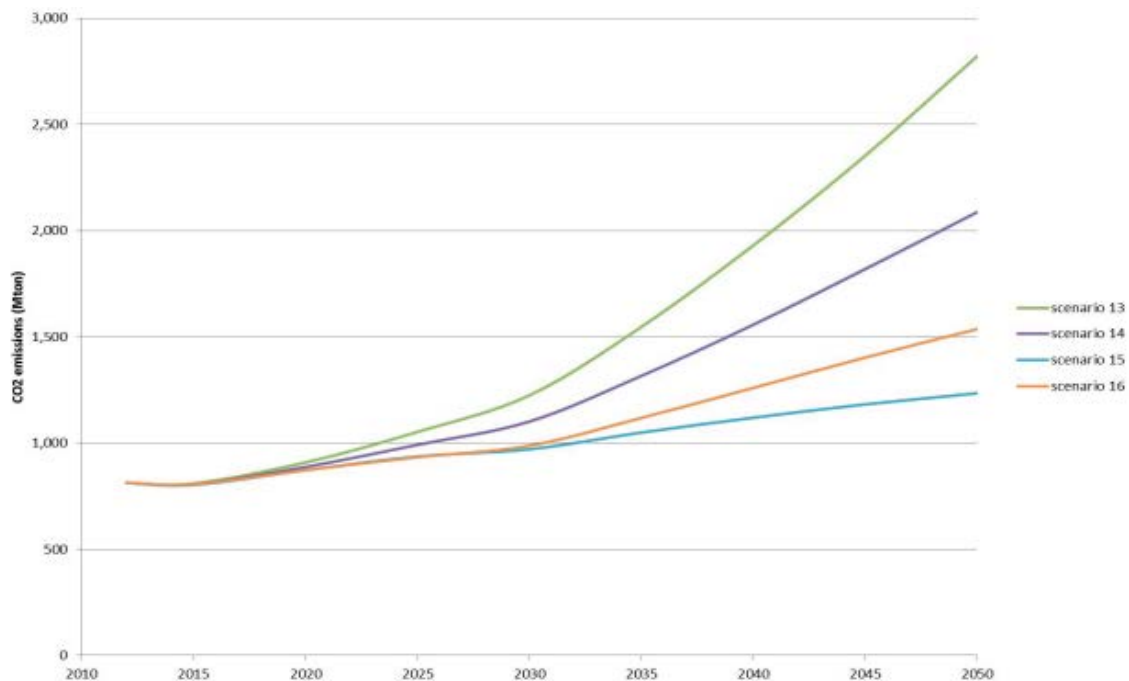


Figure 1. BAU projections of CO2 emissions from international maritime transport 2012-2050.  
Source: Third IMO GHG Study.

## 4 CONCLUSIONS

The main focus of this master's degree, which distinguishes it from others in the same field, is about investigating the role of energy systems in causing and mitigating climate change for carbon neutral management of sport marinas. Debates and major trends in the role of technologies, economics, human behaviour, social change and governance in avoiding dangerous anthropogenic climate change. Developing analytical, problem solving and communication skills in the context of a major infrastructure system. Furthermore, it examines the complex challenges of governing Sport Marinas. The term “governance” reflects a growing awareness that not only governments but a wide range of non-governmental actors at multiple scales – from international NGOs to corporations and local communities – are involved in shaping environmental strategies and outcomes. Conceptual lenses to examine and critique this complex governance landscape: from common pool resource theory; to the political economy of trade and development; to integrative conceptions of “sport marinas system governance”. These concepts are applied across a range of substantive issue areas, including climate, forests, agriculture and coastal and marine systems.

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