THE IMPACT OF THE NEW IMO REGULATIONS REGARDING THE "GREENING" OF THE SHIPPING SECTOR ON THE FUTURE PROFESSIONS IN THE FIELD OF SHIPBUILDING AND SHIP REPAIR

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IPCC REPORT

Global warming has already reached 1°C above the pre-industrial level, due to past and current greenhouse gas emissions. There is overwhelming evidence that this is resulting in profound consequences for ecosystems and people.

The ocean is warmer, more acidic and less productive. Melting glaciers and ice sheets are causing sea level rise, and coastal extreme events are becoming more severe.

SHIPS IMPACTS ON ENVIRONMENT

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EA- emission into air **EW- emission into water** **EW- emission into land** **DW- waste disposal**

4TH IMO GHG 2020 STUDY

The greenhouse gas (GHG) emissions — including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), expressed in CO_{2e} — of total shipping (international, domestic and fishing) have increased from 977 million tonnes in 2012 to 1,076 million tonnes in 2018 (9.6% increase). In 2012, 962 million tonnes were CO2 emissions, while in 2018 this amount grew 9.3% to 1,056 million tonnes of CO_2 emissions.

The share of shipping emissions in global anthropogenic emissions has increased from 2.76% in 2012 to 2.89% in 2018.

4TH IMO GHG 2020 STUDY

Emissions are projected to increase from about 90% of 2008 emissions in 2018 to 90-130% of 2008 emissions by 2050 for a range of plausible long-term economic and energy scenarios (Figure 1).

Emissions could be higher (lower) than projected when economic growth rates are higher (lower) than assumed here or when the reduction in GHG emissions from land-based sectors is less (more) than would be required to limit the global temperature increase to well below 2 degrees centigrade.

Figure 1 – *Projections of maritime ship emissions as a percentage of 2008 emissions*

IMO/MEPC CONVENTION

Establishment of new or more restricted requirements for ships by International Maritime Organisation

International Convention for the Prevention of Pollution from Ships (MARPOL) with the latest amendments

International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001

International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009

EEDI & SEEMP

IMO has adopted mandatory measures to reduce emissions of greenhouse gases from international shipping, under IMO's pollution prevention treaty (MARPOL) - the Energy Efficiency Design Index (EEDI) mandatory for new ships, and the Ship Energy Efficiency Management Plan (SEEMP).

The draft amendments bring forward the entry into effect date of phase 3 to 2022, from 2025, for several ship types, including gas carriers, general cargo ships and LNG carriers. This means that new ships built from that date must be significantly more energy efficient than the baseline.

For container ships, the EEDI reduction rate is enhanced, significantly for larger ship sizes, as follows:

For a containership of 200,000 DWT and above, the EEDI reduction rate is set at 50% from 2022

For a containership of 120,000 DWT and above but less than 200,000 DWT, 45% from 2022

For a containership of 80,000 DWT and above but less than 120,000 DWT, 40% from 2022

For a containership of 40,000 DWT and above but less than 80,000 DWT, 35% from 2022

For a containership of 15,000 DWT and above but less than 40,000 DWT, 30% from 2022

CLOSED LOOP MANUFACTURING

Industry 4.0

(Big) Data
– Analytics
– Artificial intelligence
– Virtual identity of devices, products,..
– Cyber security
Supply chain
- Integrated
- Logistic 4.0
Customers
- Mass customization
- On demand production
- Marketing and services
IT support, control
(BIG) DATA
CLOUD STORAGE
VNC - Virtual numericall controller
SCADA - Supervisory control and Data Acquisition
MES - Manufacturing Execution System
VRC - Virtual robot control
ERP - Enterprise-Resource-Planning
PLC - Programmable logical control
RC - Robot controller
CNC - Computer Numeric Control
DIGITAL TO PHYSICAL CONVERSION
Reconfigurable manufacturing systems
– Decentralised, modular
– Autonomous
– Self optimizing and self organizing
M2M interaction
Human-machine collaboration
Machine learning
Smart products
Sensors
Advan. GUIs Teleoperation
Virtual reality
Additive manufacturing
Smart Factory
Interoperability

CLOUD MANUFACTURING

CONSEQUENCES AND IMPLICATIONS

Strategic trends

- ***Convergence of applications are forming conditions of new advancements***
- ***Energy efficiency and sustainability to gain greater business focus***
- ***Greater presence of mobility and web-based information systems***

CRITICAL FACTORS

Expert knowledge, flexibility, creativity and innovation;

Convergence of production and interaction, work and communication are increasingly interdisciplinary competencies for staying economically competitive.

For companies and businesses, however, these competencies do not just appear out of nowhere.

OUR WAY OF BEHAVING

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INTELLECTUAL SOCIAL RESPONSIBILITY

Multivalent logic

Synthetic thinking

Integrative learning

Focus on results

Generate Synergies

Team work

Active involvement

BLACK SEA UNIVERSITIES NETWORK

- **Aim:** The Network was founded for the purpose of developing scientific, cultural and educational cooperation and exchanges among the Universities of the Black Sea Economic Cooperation Participating States and other institutions with similar concern for the sustainable development of the BSR
- **Members:** 120 Universities of 12 BSEC member countries
- **Bodies:** Conference of Rectors of BSR, Executive Board, President, IPS
- **Centers:** Center for Advanced Engineering Sciences (Romania), "B. S. Cobanzade" Research Center on Turkology, Baku State University, Center ACADEMICON (Turkey), Center for Coordination of Common Graduate Programs (Greece), Center for Coordination of Summer Schools & Short Term Certificate Courses (Ukraine), Center for Joint Research Projects (Azerbaijan), Center for BSUN Publications (Bulgaria),
- **Consortia:** BSUN Consortium on Economics & Business, Consortium on Oral Health, Consortium on Tourism, Consortium on RES.
- **Web site:** Http://www.bsun.org

THE PARADIGM SHIFT

- **From fixed knowledge to asking good questions;**
- **From learning as a product to learning as a process and a product;**
- **From the teacher as an expert to expert and consultant;**
- **From looking at the student as empty frames to competent learners;**
- **From teaching as “chalk and talk” to learner centered approaches.**

THE NEW GOALS IN TEACHING

- **Learning to learn;**
- **Coping with changes;**
- **Competence in relations;**
- **Proactive attitude to entrepreneurship & innovation.**

ENTREPRENEURSHIP & INNOVATION

Entrepreneurship and innovation is a specific approach or strategy to life and learning. It means that you have the attitude and skills to affect and influence your life, your society and take responsibility for active participation.

TENTATIVE PROFILE

- **To take initiative;**
- **To be creative;**
- **To communicate in different contexts;**
- **To search for possibilities and to discover and see new possibilities;**
- **To sell ideas;**
- **To run risks and take responsibility;**
- **To implement ideas and take actions;**
- **To make products and services of values in life and business.**

TEACHING APPROACHES

- **Asking good questions;**
- **Critical thinking;**
- **Commitment;**
- **Independence;**
- **Cooperative attitude;**
- **Action thinking;**
- **Responsibility.**

TEACHING APPROACHES

- **In which ways are you strong?**
- **What are your interests?**
- **What aspects of yourself would you like to develop?**
- **Which subject areas would you like to be better at?**

INDIVIDUALS vs TEAMS

- **What are you good at together with others?**
- **What are you good at alone?**
- **Which interests do each of you in your team have?**
- **What would you like to create?**
- **How would you like to be challenged?**

Open Education

Digital Platforms

- **Online Training Platform** Using the platform www.BSUN.org for online courses and the procedures for facilitating the delivery of open online courses on topics related to the Implementation Plan for a large variety of experts acting within some specialized organizations or as freelancers such as teachers, sailors, biologists and other specialists there will be developed. This shall lead to the establishment of a Massive Open Online Course – MOOC on Blue Growth in the Black Sea Region.

- **Current status**
  - The platform www.bluegrowth.bsun.org has been established with the 1st phase – a repository of online documents and courses
  - The BSUN Regional Master Degree Program
  - It has been initiated a special approach for partnering with the pre-university sector
  - It has been established a partnership with the European Network of Blue Schools
  - It has been initiated a partnership with Professional training centres

- **Planned activities**
  - Population of the repository and developing the involvement of the Universities and schools
  - Development of the BSUN Regional Master Degree Program on Blue Growth
  - Establishment of the Black Sea Network of Blue Schools

Hackathons

- **Hackathons** (Active involvement for Problem Solving): There will be organized as itinerant events around the Black Sea region in the form of small group camps for young students and researchers building Cooperative Problem-Solving Teams to address some very specific problems related to the Implementation Plan in different regions.
- **Current status**
  - The format has been defined with the support of the University of the Aegean, Greece
  - There were developed pilot activities in Harsova, Romania, Lake Sevan, Armenia
- **Planned activities**
  - Replication in Cernavoda, Medgidia, Murfatlar, Ovidiu, Eforie
  - Replication in other countries with the support BSUN Members and of the Consortium Partners

Open access to sci data

- **Black Sea Observatory on Blue Growth:** A section in the project website dedicated to the indexing of open publications on topics related to the Implementation Plan in order to facilitate the exchange of scientific results via open science actions, internet-based gatherings of scientists, policy makers and civil society to maximize the impact the science diplomacy in the region.
- **Current status**
  - BSUN partnership with EGI for accessing EOSC
  - BSUN partnership with TUBITAK BILTEN
- **Planned activities**
  - BSUN participation to the EOSC Association
  - Organization in 2022 of the 2nd Int. Conference on Open Science, Open Innovation & Open Education in the Black Sea Region

Citizen science

- **Science Fairs:** Events like European Researchers' Night and science festivals aiming to integrate/translate scientific information to a non-academic public.
- **Current status**
  - BSUN partnership with the “Stiinta si Tehnica” magazine
  - BSUN partnership with the Konya Science Centre
- **Planned activities**
  - Settingup a calender of the SciFi events in the region
  - Organization of the regional Science Fair on Blue Growth

Access to knowledge

- **Mobile caravan:** BSUN has the infrastructure for organizing mobile caravans. By developing digital applications based on multimedia and Augmented Reality (AR) technologies and their dissemination through the mobile caravan in the target areas, a large impact dissemination towards a large variety of population segments shall be obtained.
- **Current status**
  - Organization of the 1st caravan tour to Sf. Gheorghe, Romania
- **Planned activities**
  - Developing a calender to other locations

THANK YOU FOR YOUR ATTENTION!