Arab Academy
for Science, Technology and Maritime Transport

Economic and Social Commission for Western Asia (ESCWA)

Consultative Meeting on the Environmental Dimension of the Sustainable Development Agenda:
Science-based and Inclusive Environmental Solutions for Advancing SDGs Implementation

25-26 February 2025, Cairo, Egypt

Navigating the Future: Maritime Industry's Role in Achieving Sustainable Development Goals

Presented by

Prof. Dr. Kareem Tonbol

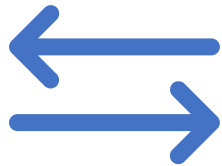Dean of Scientific Research for Maritime Affairs, AASTMT

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Maritime industry facilitates over 80% of global trade by volume.

Connects markets, supports economic development, enables global supply chains.

Statistics and Facts

Global Trade Contribution: Transports approximately 80% of global trade by volume.

Fleet Size and Age: The global fleet consists of around 99,800 commercial ships, with an average age of 22.2 years.

Port Activity: In 2021, global container port throughput reached 851.1 million TEUs, a 7% increase from the previous year.

Economic Impact: Significant contributor to the global economy, supporting millions of jobs.

Employment: Approximately 1.2 million people are employed at sea, with additional millions in related maritime jobs on shore.

Major Challenges Facing the Industry

- **Environmental Impact:** Accounts for 3% of global greenhouse gas emissions; projected increase up to 130% of 2008 levels by 2050 without intervention.

- **Regulatory Pressures:** New regulations like the EU Emissions Trading System (EU ETS) require purchase of carbon credits, increasing operational costs.

- **Technological Advancements:** Need for digital solutions (AI, blockchain, IoT) to improve efficiency and sustainability, facing cybersecurity and reliability issues.

- **Geopolitical and Economic Factors:** Global conflicts, economic volatility, and piracy resurgence complicate operations and stability.

2030 Agenda for SD: 17 goals, 169 targets

Another Way to Look at SDGs

PEOPLE
End poverty and hunger in all forms and ensure dignity and equality

PROSPERITY
Ensure prosperous and fulfilling lives in harmony with nature

PEACE
Foster peaceful, just and inclusive societies

PARTNERSHIP
Implement the agenda through a solid global partnership

PLANET
Protect our planet's natural resources and climate for future generations

Sustainable Development

IMO's Commitment to SDGs

- IMO is committed to supporting the UN's 2030 Agenda for Sustainable Development by aligning its regulations and initiatives with the 17 Sustainable Development Goals (SDGs).

- IMO plays a pivotal role in promoting safe, secure, and efficient shipping on clean oceans.

IMO's Commitment to Promoting Sustainability

Regulations:

➢ MARPOL Convention: Addresses pollution from ships.

➢ Ballast Water Management Convention: Prevents the spread of harmful aquatic organisms.

➢ IMO 2020 Sulphur Cap: Limits sulphur content in marine fuel to 0.50%.

IMO's Commitment to Promoting Sustainability

Guidelines:

➢ Energy Efficiency Design Index (EEDI): Sets standards for new ships to improve energy efficiency.

➢ Ship Energy Efficiency Management Plan (SEEMP): Encourages operational efficiency for existing ships.
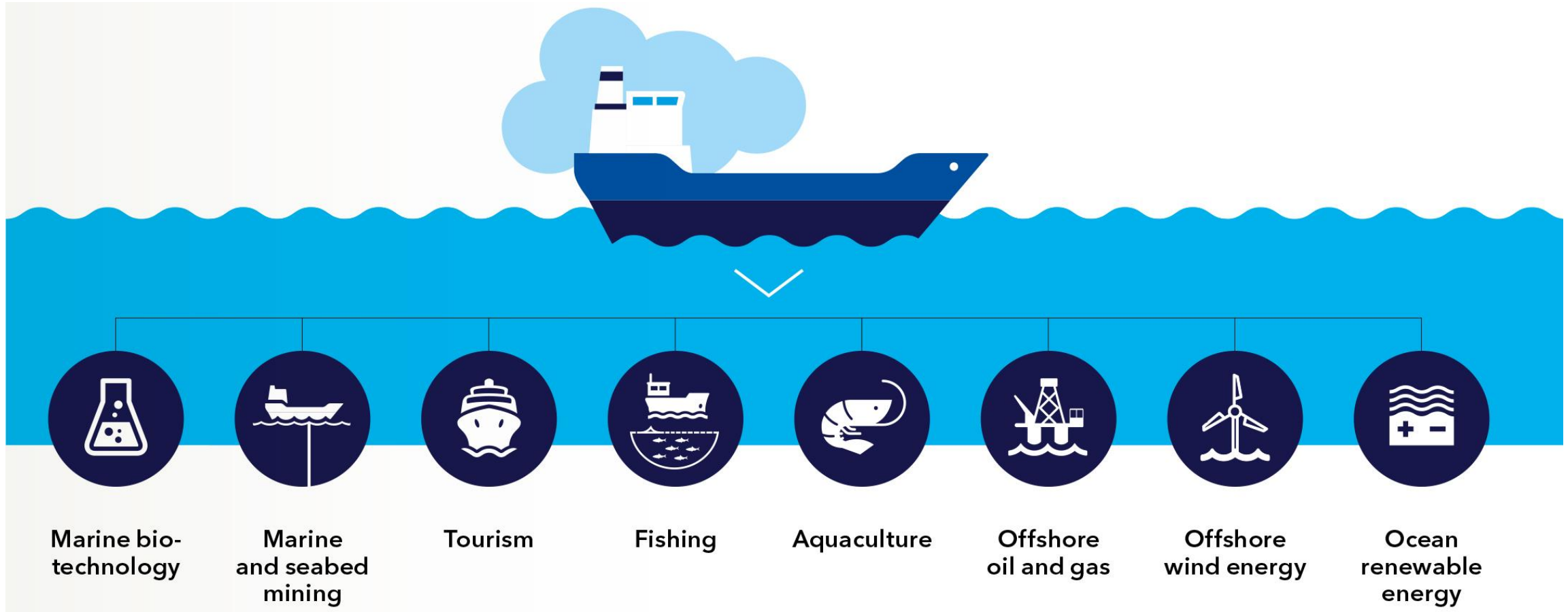
IMO's Commitment to Promoting Sustainability

Initiatives:

➤ GreenVoyage2050: Aims to reduce greenhouse gas emissions and promote low-carbon shipping.

➤ GloMEEP: Supports the implementation of energy efficiency measures in developing countries.

➤ Women in Maritime: Promotes gender equality and empowers women in the maritime sector.
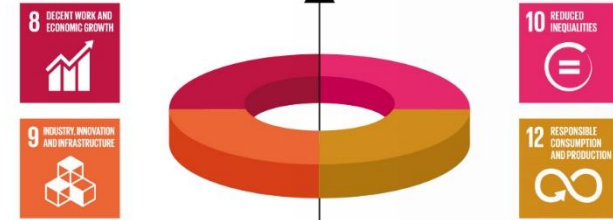
Marine bio-technology

Marine and seabed mining

Tourism

Fishing

Aquaculture

Offshore oil and gas

Offshore wind energy

Ocean renewable energy

The analysis of the Sustainable Development Goals and their relevance for the shipping industry is structured into three interconnected categories: goals related to the **biosphere**, goals related to **society**, and goals related to the **economy**.

Redrawn from Stockholm Resilience Centre; Folke et al., 2016; SRC & IIASA, 2016; Rockström, J. and Sukhdev, P., 2016).

Biosphere

- Shipping is responsible for approximately 3% of total anthropogenic CO_2 emissions, or about 900 million tonnes per year. Current regulations address energy efficiency on new ships. The IMO has agreed on a roadmap for developing a GHG reduction strategy.

- Accidental **oil spills** have been reduced from 300,000 tonnes per year in the 1970s to 5,000 tonnes per year in the period 2010 to 2015.

- Ships emit around 18 million tonnes NO_X (15% of world total) and 10 million tonnes SO_X (5–8% of world total) annually. New regulations are expected to reduce emissions.

- Shipping is a major contributor to introducing **alien species** across ecosystems. The newly ratified Ballast Water Management Convention will reduce the transfer of species. However, biofouling, which also contributes to the movement of alien species, remains unregulated.
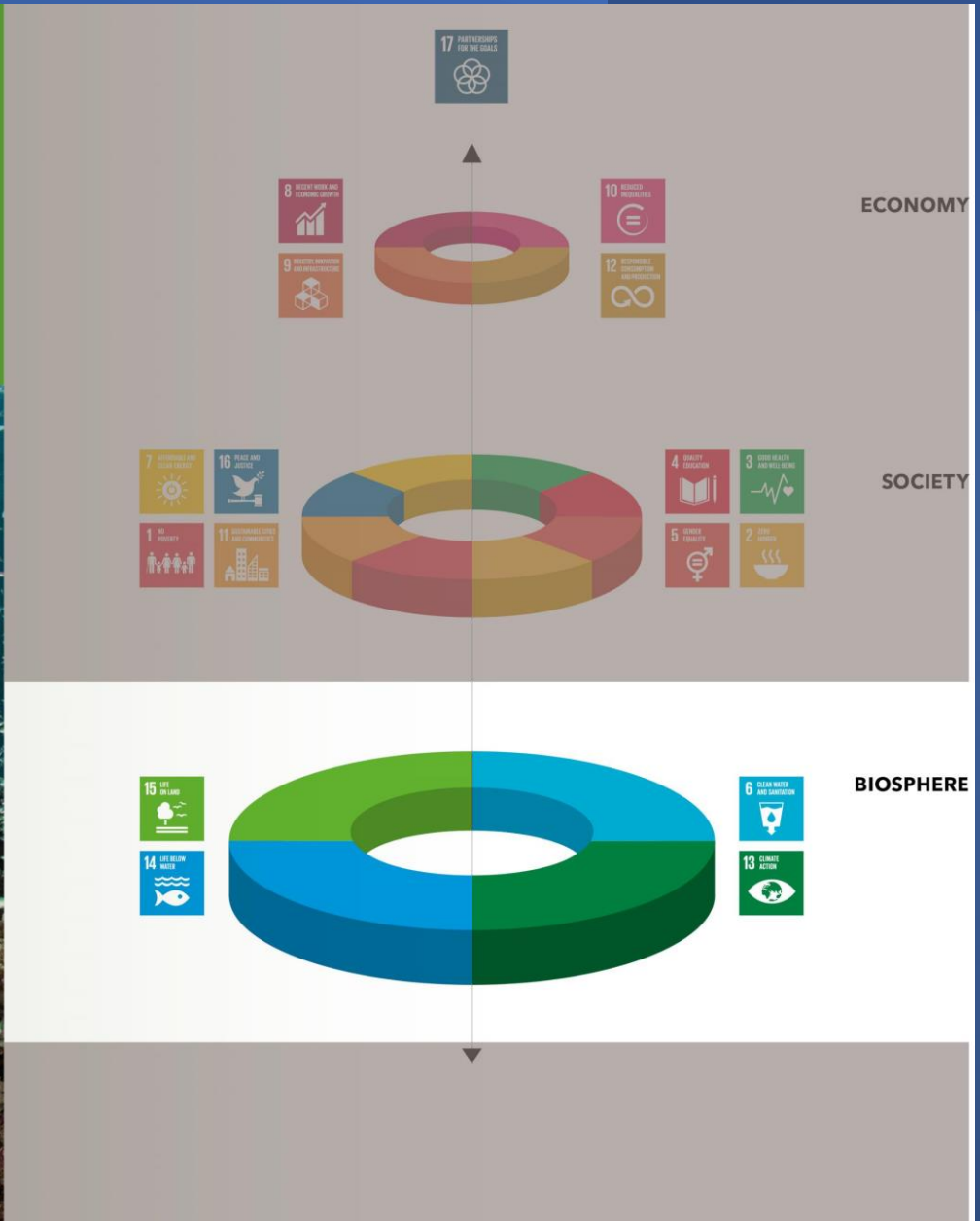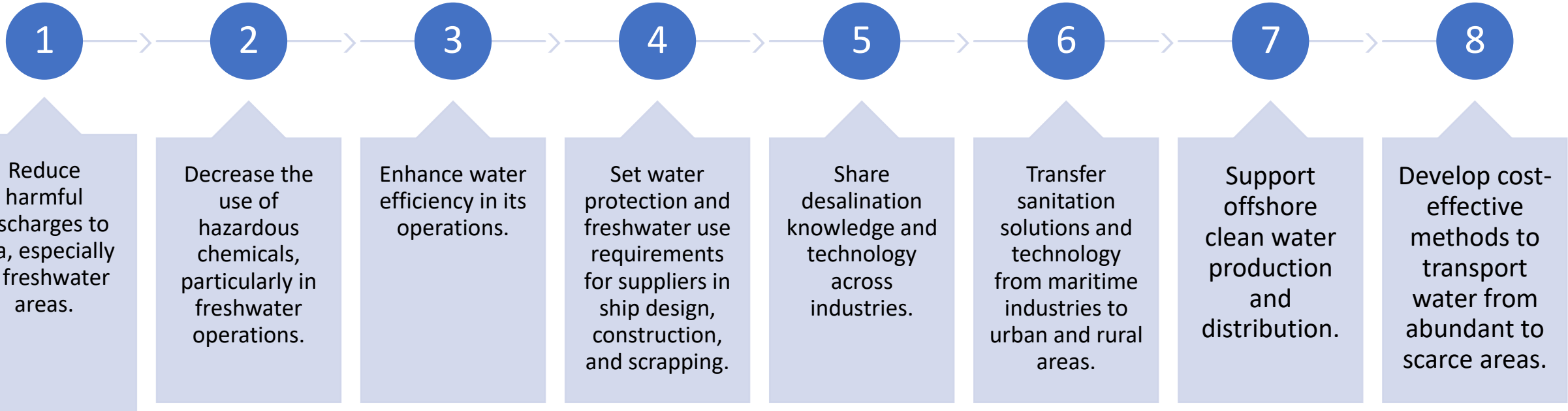
SDG 6: Clean water and sanitation

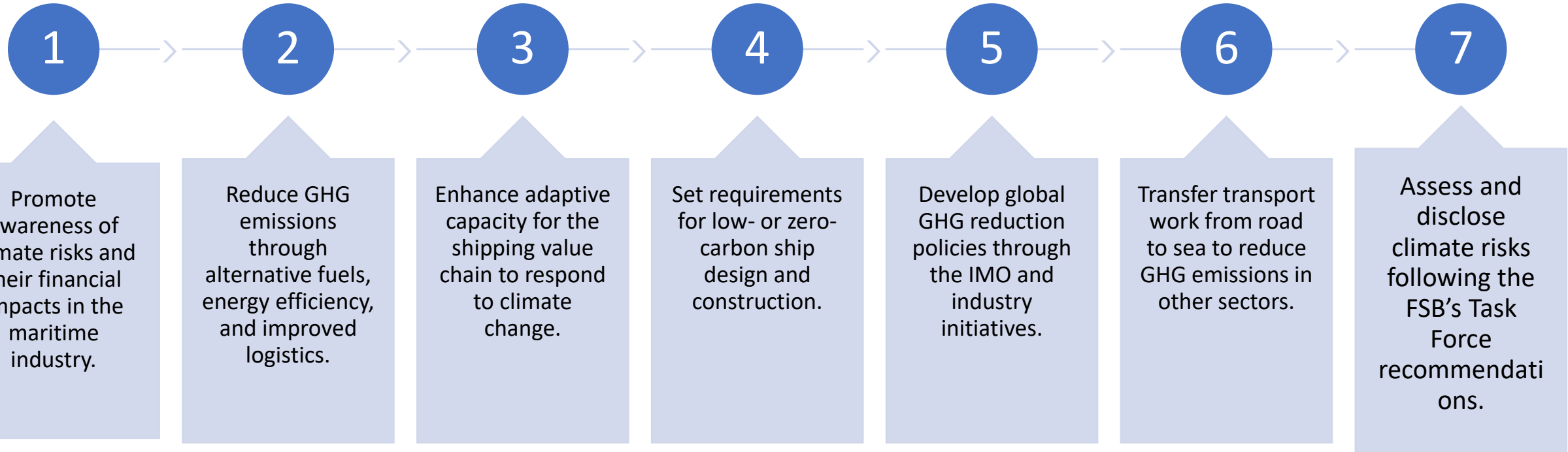The goal aims to ensure availability and sustainable management of water and sanitation for all.

1 Reduce harmful discharges to sea, especially in freshwater areas.

2 Decrease the use of hazardous chemicals, particularly in freshwater operations.

3 Enhance water efficiency in its operations.

4 Set water protection and freshwater use requirements for suppliers in ship design, construction, and scrapping.

5 Share desalination knowledge and technology across industries.

6 Transfer sanitation solutions and technology from maritime industries to urban and rural areas.

7 Support offshore clean water production and distribution.

8 Develop cost-effective methods to transport water from abundant to scarce areas.

SDG 13: Climate action

The goal calls for urgent action to combat climate change and its impacts. It acknowledges the UNFCCC as the main international intergovernmental forum for negotiating the global response to climate change. Shipping emissions are currently not included under the UNFCCC negotiations. However, the IMO has been tasked with developing measures to reduce GHG emissions from international shipping.
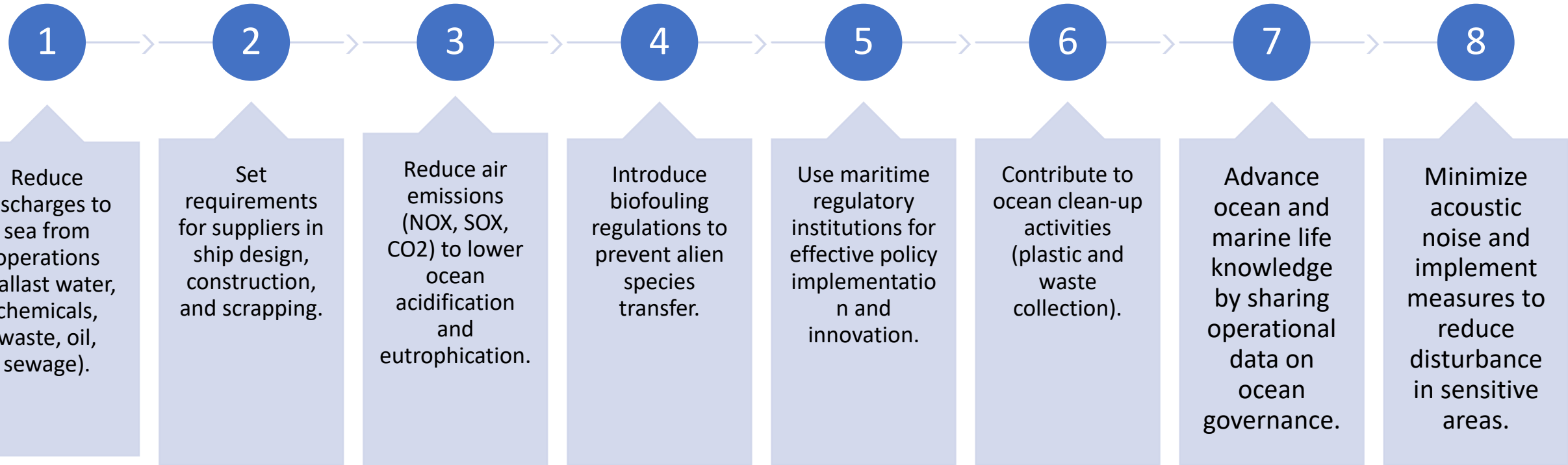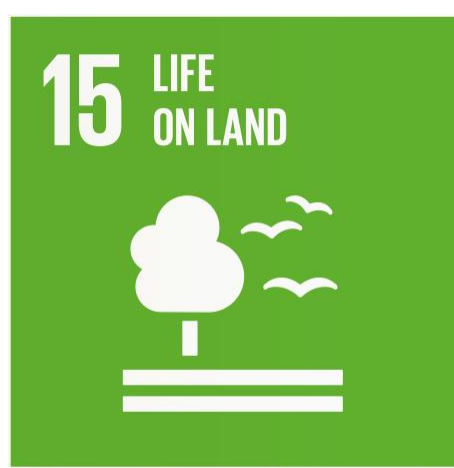
1	2	3	4	5	6	7
Promote awareness of climate risks and their financial impacts in the maritime industry.	Reduce GHG emissions through alternative fuels, energy efficiency, and improved logistics.	Enhance adaptive capacity for the shipping value chain to respond to climate change.	Set requirements for low- or zero-carbon ship design and construction.	Develop global GHG reduction policies through the IMO and industry initiatives.	Transfer transport work from road to sea to reduce GHG emissions in other sectors.	Assess and disclose climate risks following the FSB's Task Force recommendations.

SDG 14: Life below water

The goal aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

1 Reduce discharges to sea from operations (ballast water, chemicals, waste, oil, sewage).

2 Set requirements for suppliers in ship design, construction, and scrapping.

3 Reduce air emissions (NOX, SOX, CO2) to lower ocean acidification and eutrophication.

4 Introduce biofouling regulations to prevent alien species transfer.

5 Use maritime regulatory institutions for effective policy implementation and innovation.

6 Contribute to ocean clean-up activities (plastic and waste collection).

7 Advance ocean and marine life knowledge by sharing operational data on ocean governance.

8 Minimize acoustic noise and implement measures to reduce disturbance in sensitive areas.

SDG 15: Life on land

The goal aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.

Improve ballast water management and treatment to prevent alien species transfer.

Introduce biofouling regulations to stop alien species transfer.

Support ocean-based food and energy production to reduce pressure on land ecosystems.

SOCIETY

- More than 80% of all goods (by volume) are transported by ships, providing access to global markets for food, energy and other products. Shipping is a very **efficient mode of transport**, with current freight costs calculated to be 7% relative to the value of goods for developed countries and to be 8 to 11% for developing countries.

- NO_X, SO_X and PM emissions from ships are a source for **pollution in coastal areas and cities**. Emissions of particulate matter from shipping are estimated to cause 60000 cardiopulmonary and lung cancer deaths per year.

- Shipping is a major transporter of goods, which may include illicit cargo. It operates worldwide and is **vulnerable to corruption**.

SOCIETY
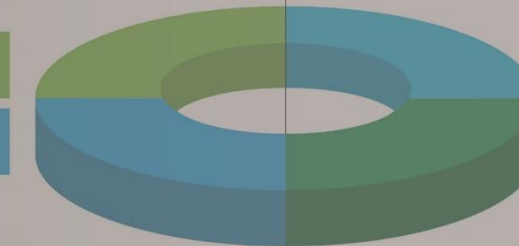
SDG 1: No poverty

The goal aims to end poverty in all its forms everywhere.

Provide affordable and sustainable transportation for goods and people.

Ensure affordable access to markets.

Provide basic goods for vulnerable groups to build resilience and during emergencies.

Create jobs in operations, ship design, construction, and scrapping.

Promote job creation and growth in the ocean economy.

Contribute to affordable energy and food by facilitating ocean-based energy and food production.

SDG 2: Zero hunger

The goal aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture.

Facilitate

harvesting and production of sustainable food from the ocean space by supporting installation and operation of production assets.

Provide

affordable and sustainable transportation of food.

Provide

access to food markets and thereby reduce food price volatility.

Provide

access to food for vulnerable groups to build resilience and provide assistance in cases of emergencies.

SDG 3: Good health and well-being

The goal aims to ensure healthy lives and promote well-being for all at all ages.

Support	Provide	Continue	Continue	Continue	Set	Use
its own employees who experience substance abuse.	alternative, maritime transport services to reduce road transport, thereby reducing traffic accidents.	to reduce discharges to sea from its own operations, such as chemicals, oil, sewage and grey water.	to reduce emissions from air from its own operations, such as NOX, SOX and PM.	to reduce the use of hazardous chemicals in its own operations.	requirements for suppliers within ship design, construction and scrapping with regard to chemical use, and emissions to air, water and soil.	maritime regulatory institutions to effectively implement policies.

SDG 4: Quality education

The goal aims to ensure inclusive and equitable quality education and to promote lifelong learning opportunities for all.
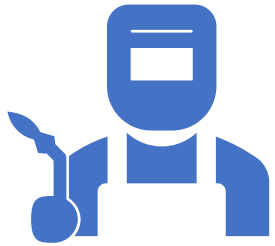
Continue to provide vocational education, training and traineeships in its own operations.

Continue to support maritime academies to ensure a skilled future workforce.

Develop global standards for skills and education to help accelerate education and training globally in the sector.

SDG 5: Gender equality

The goal aims to achieve gender equality and empower all women and girls.

Improve gender equality in its own operations.

Targeted recruitment and mentoring of women in leadership positions.

SDG 7: Affordable and clean energy

The goal aims to ensure access to affordable, reliable, sustainable and modern energy for all.

|				
Provide shipping services for distributing renewable energy – dependent on the type of energy and location of production.	Provide shipping services and technology related to harvesting offshore energy, for example solar, tidal, wind, wave and biomass energy.	Increase the use of renewable energy solutions in its own operations, such as biofuels, hydrogen, solar and wind.	Improve energy efficiency of all parts of its own operations.	Continue to develop and implement zero-emission solutions.
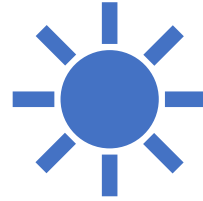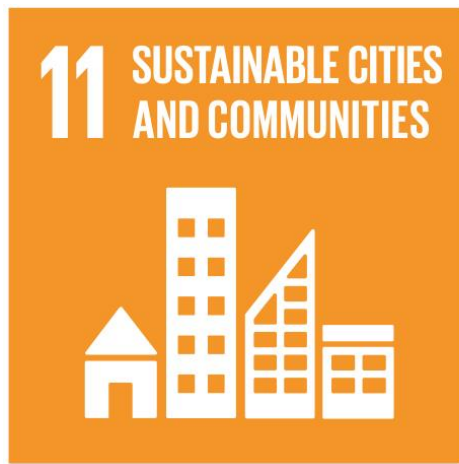
SDG 11: Sustainable cities and communities

The goal aims to make cities and human settlements inclusive, safe, resilient and sustainable.
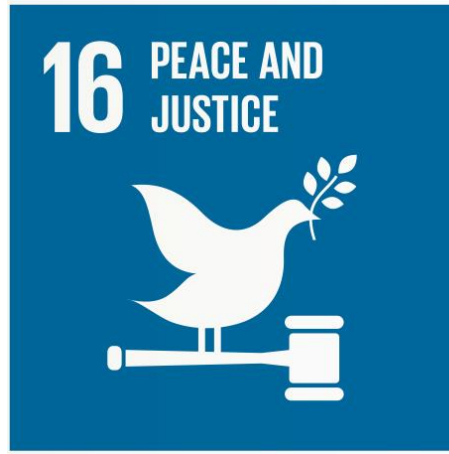
Provide safe, affordable, accessible and sustainable transport services in cities, such as zero emission ferries and passenger ships.
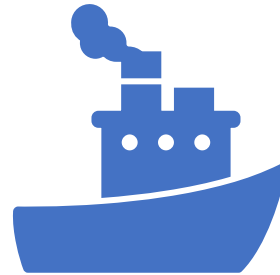
Continue to develop and implement zero emission solutions for urban transport.

Promote and use shore-based electricity when in port to reduce emissions.

SDG 16: Peace, justice and strong institutions

The goal aims to promote peaceful and inclusive societies, to provide access to justice for all and to build effective, accountable and inclusive institutions at all levels.

Increase

transparency on cargoes, destinations, financial transactions and on the use of agents and intermediaries.

Reduce

corruption and bribery through effective compliance systems and proper training.

Implement

mechanisms for internal reporting and safeguards for whistle-blowers.

Strengthen

global and national maritime regulatory institutions to reduce opportunities for corruption, bribery and illicit cargo flows.

ECONOMY

- The **economic output** of the maritime industry is estimated to 300 billion USD gross value added (GVA) and 5 million full-time jobs. The total output for all ocean industries is around 1.5 trillion USD GVA and 31 million full-time jobs.

- SOLAS and the Maritime Labour Convention regulate **safety and working conditions** in international shipping. There are about 6 fatalities per 100 million work hours on board ships per year (excluding fishing), which is ten times the OECD average for all industries.

- 90% of all ships are recycled, but many ships are still **recycled on beaches** in developing countries without decent and safe working conditions.
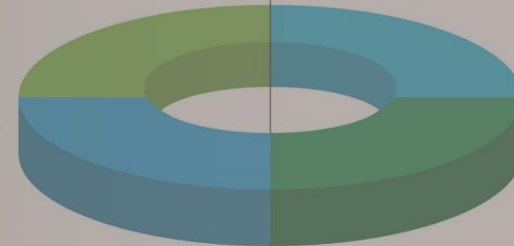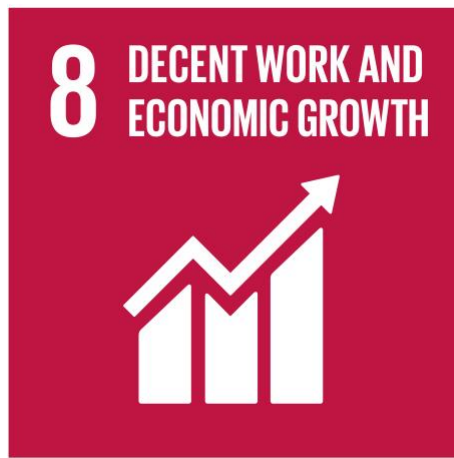
ECONOMY

SDG 8: Decent work and economic growth

The goal aims to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

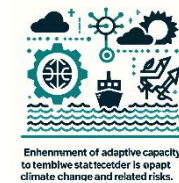| Provide affordable and sustainable shipping services facilitating economic growth and job creation across industries. | Continue to improve labour rights and safety practices in its own operations, by implementing ILO, SOLAS and other relevant conventions, and by setting requirements for suppliers within ship design, construction and scrapping. | Continue to use maritime regulatory institutions to develop and implement common safety regulations. | Provide access to training and development in all segments. | Provide sustainable cruises to support sustainable tourism. |

SDG 9: Industry, innovation and infrastructure

The goal aims to build resilient infrastructure, to promote inclusive and sustainable industrialization and to foster innovation.

Retrofit and upgrade its own vessels with new, environmentally friendly technologies.	Improve shipping services in geographical areas where there is a further need for affordable and equitable access to shipping services.	Enhance adaptive capacity, to enable stakeholders in the shipping value chain to adapt and respond to climate change and related risks.	Increase spending on R&D in the ocean space and in related industries and join public and/or private partnerships to develop infrastructure to support sustainable resource exploitation.

SDG 10: Reduced inequalities

The goal aims to reduce inequality within and among countries.

Ensure

diversity and living wages within its own operations and for suppliers.

Ensure

that all sea transport is orderly and safe.

Work

with governments to enhance search and rescue activities in relevant areas.

SDG 12: Responsible consumption and production

The goal aims to ensure sustainable consumption and production patterns.

Facilitate harvesting and production of sustainable food from the ocean space.	Continue to reduce waste generation, including food waste, from its own operations.	Prevent food losses in the value chain by providing efficient and reliable transportation of food.	Continue to improve management of the use of chemicals in its own operations.	Continue to reduce discharges of chemicals from its own operations.	Implement reporting on sustainability performance based on recognized standards such as the Global Reporting Initiative (GRI) or the International Integrated Reporting Framework.

SDG 17: Partnerships for the goals

The goal aims to revitalize the global partnership for sustainable development.

Participate in partnerships with industry, NGOs and public bodies to promote sustainable practices, technology transfer and experience sharing.

Develop shipping specific sustainability policies and mechanisms through the IMO and industry-specific collaborative initiatives.

Contribute in making international governance of the ocean space more effective, and in improving coordination with other international bodies.

The potential for shipping to contribute to each goal

Climate Change Management through Mitigation and Adaptation (AdapTM), Selection: 2017
M.Sc. Degree
Smart Environment and Climate Change Management, SECCM

EU Partners

University of Catania, Italy (Coordinator)

University of Klaipéda, Lithuania

Euro-Mediterranean University, Portroz, Slovenia

National Observatory of Athens, Greece

Egyptian Partners

Arab Academy for Science and Technology and Maritime Transport, Alexandria, Egypt

Alexandria University, Egypt

Suez Canal University, Ismailia, Egypt

South Valley University, Qena, Egypt

BLUE-ERA

Co-funded by the Erasmus+ Programme of the European Union

Curriculum Development for the Sustainable Blue Economy Study Toward the Achievement of Ocean Decade in Tunisia, Egypt, and Jordan / BLUE-ERA

M.Sc. Degree

Sustainable Blue Economy and Coastal Resources Management, SBECRM

EU Partners

University of the Littoral Opal Coast (ULCO), France

University of the Aegean (UAEGEAN), Greece

Universidad de estudios de Palermo (UNIPA), Italy

Arab Partners

AASTMT, Egypt

Alexandria University (AU), Egypt

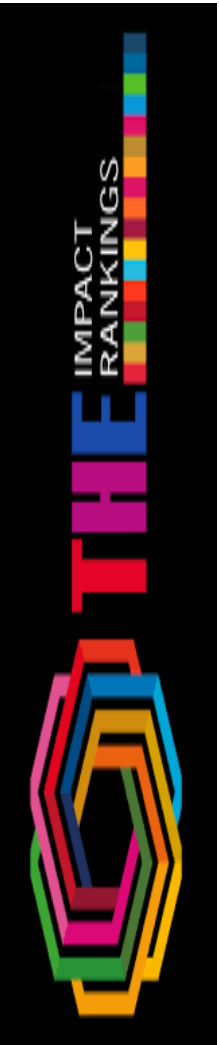University of Sousse (US), Tunisia

University of Monastir (UM), Tunisia

University of Jordan (JU), Jordan

Al Albayt University (AABU), Jordan

SDGs	2021		2022		2023		2024	
	Rank Worldwide	Rank Egypt	Rank Worldwide	Rank Egypt	Rank Worldwide	Rank Egypt	Rank Worldwide	Rank Egypt
	601-800/1117	13/31	401-600/1410	6/36	401-600/1591	7/37	301-400/1963	3/46
SDG1: No Poverty	-	-	401-600/769	9/28	601-800/876	17/28	201-300/1093	4/33
SDG2: Zero Hunger	-	-	201-300/553	6/19	401-600/647	17/21	201-300/803	5/22
SDG3: Good Health and Well-being	-	-	601-800/1101	19/31	801-1000/1218	29/34	1001+/1498	35/43
SDG4: Quality Education	201-300/965	3/25	101-200/1180	1/31	301-400/1304	4/32	84/1681	1/38
SDG5 : Gender Equality	601+/776	20/23	401-600/938	7/27	601-800/1081	16/31	301-400/1361	3/35
SDG6: Clean Water and Sanitation	-	-	201-300/635	7/22	101-200/702	3/25	201-300/867	6/34
SDG7: Affordable and Clean Energy	201-300/560	5/16	22/706	3/22	101-200/812	7/28	=6/987	1/33
SDG8: Decent Work and Economic Growth	-	-	201-300/850	3/20	101-200/960	1/23	101-200/1149	1/28
SDG9: Industry, Innovation, and Infrastructure	-	-	401-600/786	9/21	401-600/873	10/24	401-600/1018	9/23
SDG10: Reduced Inequality	-	-	101-200/796	2/25	401-600/901	9/27	201-300/1108	4/30
SDG11: Sustainable Cities and Communities	-	-	401-600/783	12/21	601-800/860	19/25	401-600/1026	11/27
SDG12: Responsible Consumption and Production	-	-	201-300/606	4/17	201-300/674	2/18	101-200/825	2/25
SDG13: Climate Action	301-400/566	6/13	401-600/674	13/17	101-200/735	1/26	401-600/924	13/30
SDG14: Life Below Water	201-300/379	4/9	201-300/452	4/12	201-300/504	5/13	101-200/628	1/17
SDG15: Life on Land	-	-	301-400/521	7/10	401+/586	13/15	401-600/741	10/16
SDG16: Peace, Justice, and Strong Institutions	-	-	301-400/746	6/21	401-600/856	7/21	201-300/1037	2/23
SDG17: Partnerships for the Goals	801-1000/1154	24/31	1001+/1441	30/36	301-400/1625	6/38	401-600/2031	5/46

Thank You!

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