

**ADDRESSING MARITIME DECARBONIZATION THROUGH
EDUCATION, RESEARCH AND CAPACITY BUILDING IN
MARITIME ENERGY MANAGEMENT (MEM): A SUCCESS STORY
OF THE WORLD MARITIME UNIVERSITY**

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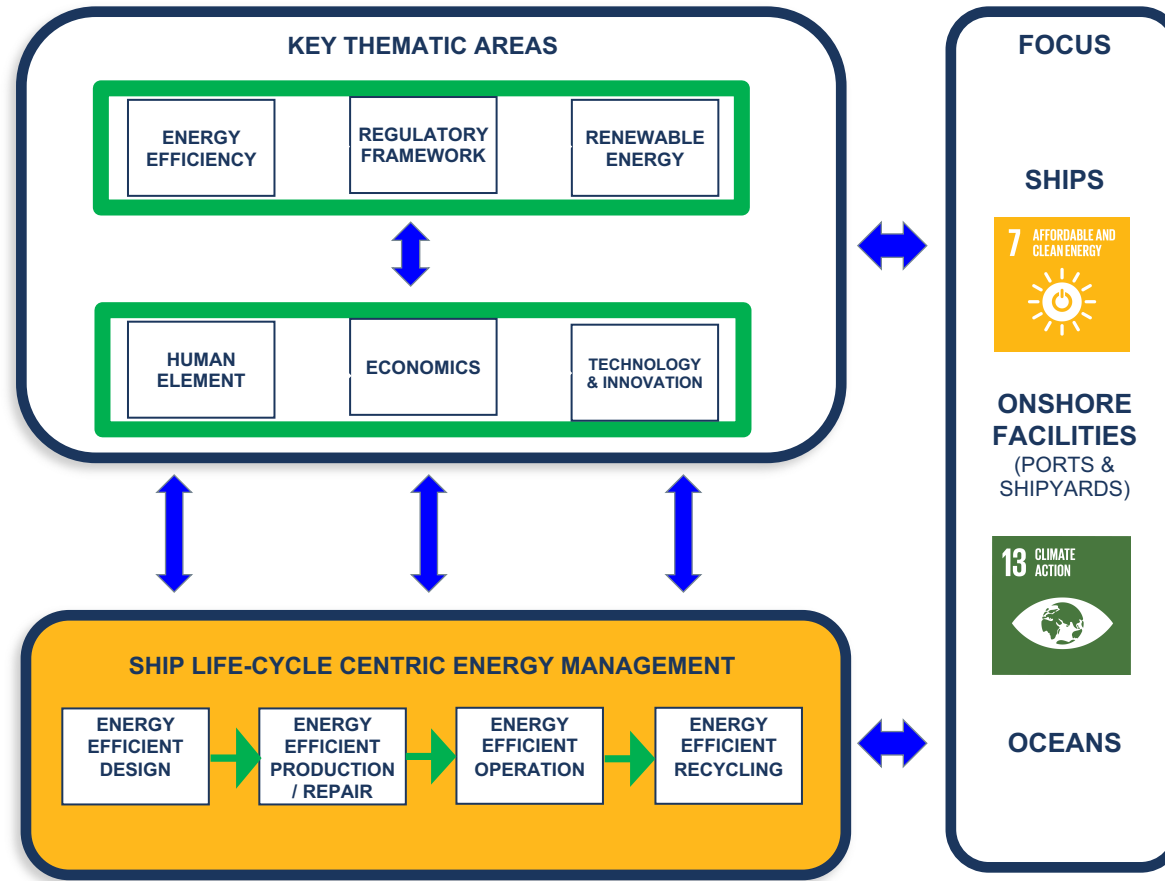
AIR POLLUTION - MOTIVATION AND DRIVERS & MEM

- ❑ Environmental impact of Air Pollutants and GHGs (climate change, ..) and other externalities
- ❑ More stringent environmental regulations (MARPOL Annex VI Chapter 4), Kyoto to Paris Agreement and the latest IMO GHG Strategy
- ❑ Volatile fuel oil price
- ❑ World population, energy demand and prices
- ❑ Energy resources scarcity and Energy security
- ❑ UN2030 Agenda (SDGs 7 & 13 in particular)



THE HOLISTIC VIEW OF MARITIME ENERGY MANAGEMENT

- ❑ Regulatory framework
- ❑ Energy efficiency
- ❑ Renewable / Cleaner energy
- ❑ **Technology and Innovation**
 - ❑ 4th Propulsion Revolution?
- ❑ Human element
- ❑ Economics of energy management



NEW TECHNOLOGIES FOR GREENER SHIPPING

IMO
World Maritime Theme for 2021
Seafarers: At the Core of Shipping's Future




IMO
World Maritime Theme for 2020
Sustainable Shipping for a Sustainable Planet



IMO
World Maritime Theme for 2022
New Technologies For Greener Shipping



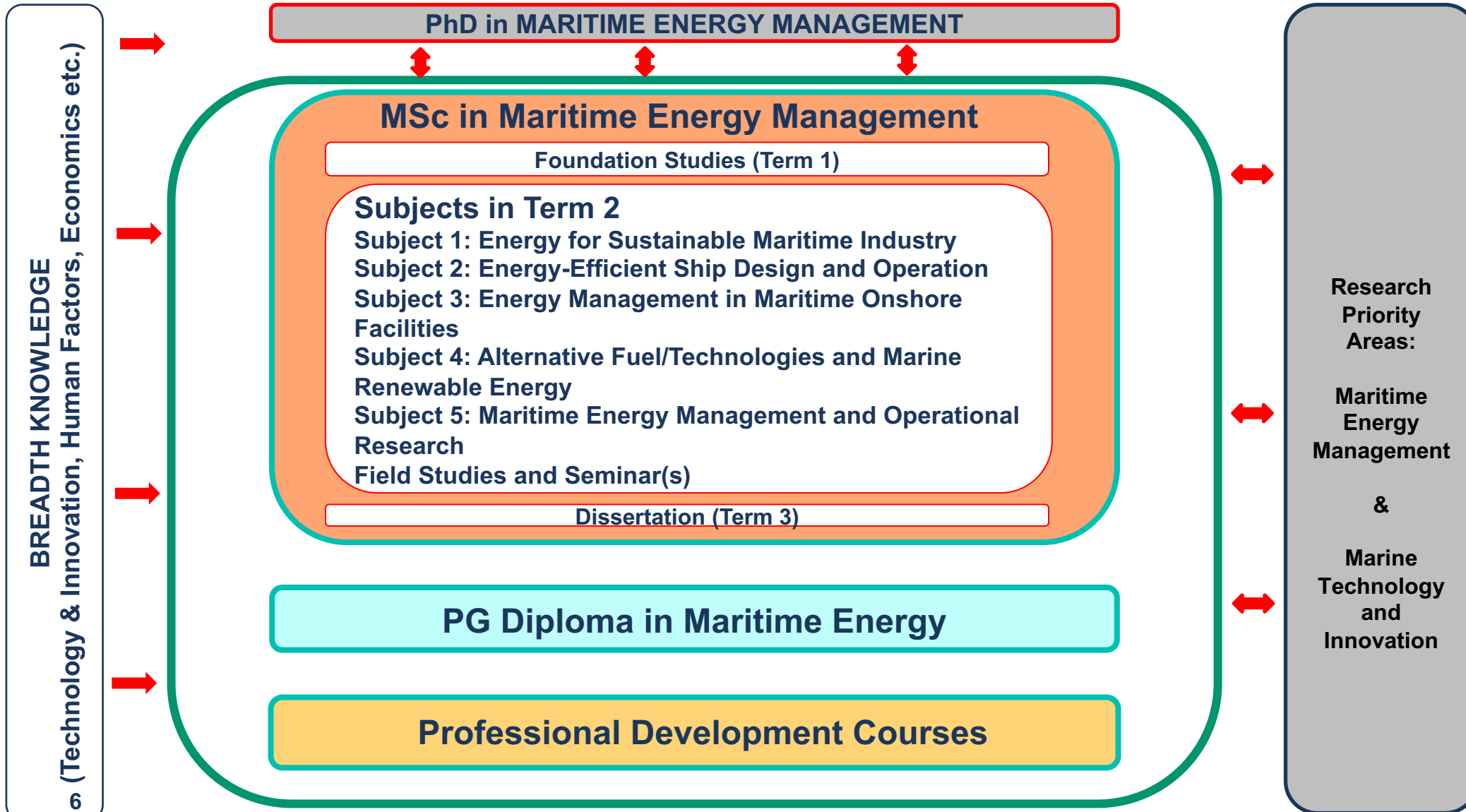
- Ballast Water (Invasive Species)
 - Sewage
 - Marine Litter
 - Under Water Noise
 - Chemicals
 - (Anti) Fouling
 - Oil Spilage
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MAINSTREAMING MARITIME DECARBONISATION IN HIGHER EDUCATION



**Zero/Low Carbon and
Energy Efficient
Maritime Industry**

THE PG PATHWAY IN MEM STREAM



FUTURE MARITIME LEADERS

- 62 Graduates from MSc in MEM
 - 34 out of 62 are from Africa

- More than 40 Graduates in PG Dip in ME

Including Maritime Professionals from LDCs and SIDS

- Maritime administrations, ports, classification societies, shipping companies, shipyards, academic institutions and so on.

- Colleagues at IMO

- Country delegation in plenary session of MEPC

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RESEARCH

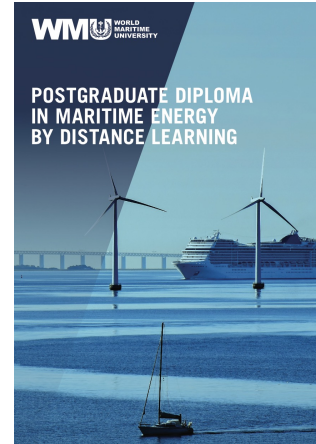


- ❑ EU Funding from FP6, FP7 to H2020
 - ❑ CHEK (deCarbonizing sHipping by Enabling Key technology symbiosis on real vessel concept designs)
- ❑ Regional Funding
 - ❑ Nordic Energy Research – CAHEMA (Concepts of ammonia/hydrogen engines for marine application)
 - ❑ Trafikverket – ETS Impact
- ❑ PhD Research
 - ❑ Wide Spectrum of Topics
- ❑ MSc dissertations (https://commons.wmu.se/mem_dissertations/)
- ❑ Collaboration with IMO
 - ❑ Literature Review of the Com. Impact Assess. of short term measures – MEPC76
- ❑ Research Workshops
 - ❑ Nordic Energy Research Seminar
- ❑₈ Link curriculum content and delivery to research



OUTREACH AND CAPACITY BUILDING

- ❑ PG Diploma in Maritime Energy by DL



- ❑ Professional Development Courses

- ❑ Global Sulphur Limit Workshops
 - ❑ With Collaboration with MTCCs and DMA

- ❑ Conferences and Seminars
 - ❑ MARENER 2017 Conference
 - ❑ MTCC Seminar at WMU



Global Participation - International Peer to Peer Workshops on IMO Global Sulphur Limit 2020

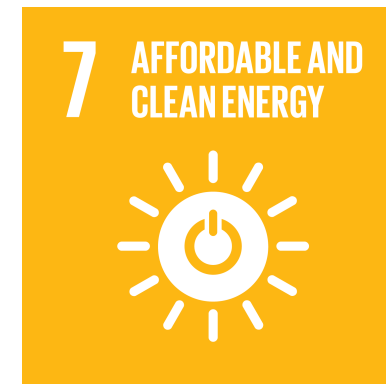


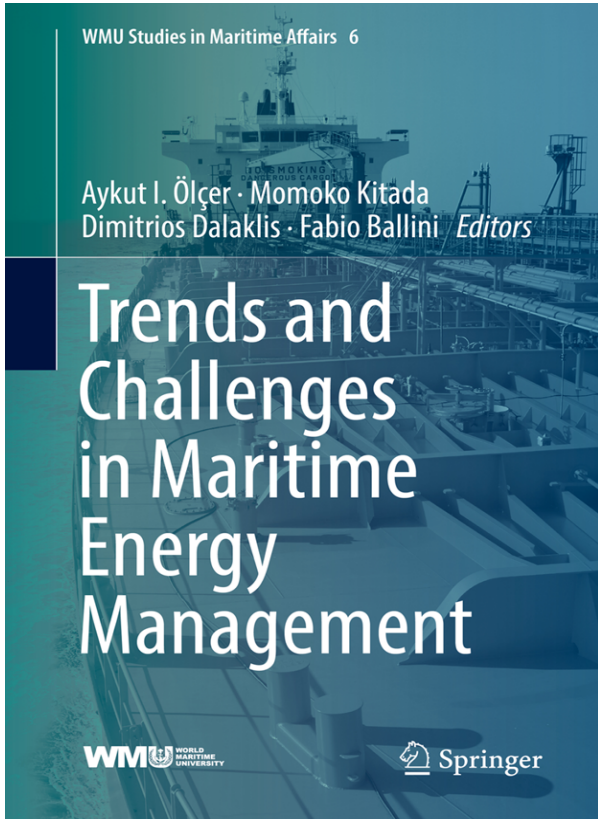
THE WAY FORWARD

- ❑ Holistic and transdisciplinary view
- ❑ Right combination of thematic pillars and measures
- ❑ Mindset change and paradigm shift
- ❑ Global collaboration amongst all stakeholders
- ❑ Life-cycle perspective within energy and maritime supply chain
- ❑ Last but not least **INVEST ON FUTURE MARITIME LEADERS**
 - ❑ (WMU model and its translation into regional/local context)

While keeping the following in mind:

- ❑ *Empowering women in the maritime industry and*
- ❑ *Building resilience for disruptions such as COVID-19*





THANK YOU

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