

The WCTR summer session hosted by Special Interest Group A2 (Ports and Maritime) was held on Wednesday 27 July. A series of five key maritime and port topics was lined up: greening, digitalization, the Northern Sea Route, education and skills, and smart port measurement.

As to greening options in maritime shipping and ports, dr. Anastasia Christodoulou (World Maritime University) moderated a panel composed of Faig Abbasov (Transport and Environment), Bud Darr (Mediterranean Shipping Company), Prof. Harilaos Psaraftis (Denmark Technological University), and Raul Cascajo Jimenez (Port Authority of Valencia). Anastasia Christodoulou introduced the topic highlighting the fact that there is no 'silver bullet' for the 'greening' and the decarbonization of maritime transport and there are different dimensions and measures that need to be considered, including technology and operational energy efficiency improvements onboard the vessels, the use of alternative fuels and energy sources (i.e. wind propulsion), the role of regulation and policy for the encouragement and the acceleration of the various initiatives. The distinct and essential role of ports for the decarbonization of the sector – from the provision of onshore power supply and refueling points for alternative fuels to their potential role as hubs for the production of these fuels – was also part of the panel discussion. Faig Abbasov presented the FuelEU Maritime initiative – part of the EU Fit-for-55 – and the need to support the uptake of green fuels through dedicated targets for e-fuels in shipping and a multiplier of 5 to boost their cost-competitiveness vis-à-vis other fuels given the fact that these fuels are still too expensive even after a carbon price of 100USD/tonne of fuel. Bud Darr discussed numerous decarbonization initiatives undertaken by the Mediterranean Shipping Cruise Group and their impact on the company's carbon footprint and operations. Harilaos Psaraftis analysed the market-based measures (MBMs) discussed at the IMO and the EU for the reduction of GHG emissions from shipping and focused on the relevant processes at both regional and international level. Raul Cascajo Jimenez presented the decarbonization strategy of the Port Authority of Valencia underlining the four pillars for the decarbonization of the port – renewable energies, use of alternative/clean fuels, energy efficiency and digitalization.

Concerning digital collaboration potential and progress in maritime and ports, Prof. Giuseppe Mussolino and Prof. Francesco Russo (Università Mediterranea di Reggio Calabria) moderated a panel composed of Richard Morton (IPCSA), Pat O'Leary (PEMA), and Chee Yew Wong (Leeds University Business School). The panelists reported their point of view on the enhancement of the vertical integration along the supply chains and of the horizontal integration among the port stakeholders. Francesco Russo presented a theoretical framework to assess the role of emerging ICT inside the Port

Community Systems (PCS) for the solution of shared decisions among the port stakeholders. Pat O'Leary addressed the levels of machine digitalisation and the evolution process from Product Manufacturer to System Integrator. Cee Yew Wong presented the elements of virtual integration of the "vertical" chains for real-time visibility-tracking and the possibility to relate with "horizontal" chains. Richard Morton stressed the necessity to put at the center of analysis the human behaviour and the importance of having standards, in order to consider the technology as an instrument and not an end. Giuseppe Musolino stated that some interesting elements have emerged in each presentation. The objective will be to further specify together the theme of digitalization and of the 5th-generation ports during some internal meetings towards the WCTR2023 Conference.

On the Northern Sea Route, Prof. Elena Efimova (Saint Petersburg State University) moderated a panel composed of Prof. Nikolay Didenko (Peter the Great St. Petersburg Polytechnic University), Assoc. Prof. Kseniya Kikkas (Peter the Great St. Petersburg Polytechnic University), Anna Kuzaeva (FORMAT LLC), Kseniya Mitryukova (Saint Petersburg State University), and Zhixing Shen (Saint Petersburg State University). The Northern Sea Route (NSR) is a maritime route officially defined by Russian legislation as lying east of Novaya Zemlya and running along the Russian Arctic coast from the Kara Sea, along Siberia, to the Bering Strait. It does not include the Barents Sea, and it therefore does not reach the Atlantic. The main task of the section is to review the main issues of the NSR in order to minimize the gap between academic research and practice. Arctic issues are under the scrutiny of politicians, businessmen, academics and military experts. Nikolay Didenko and Kseniya Kikkas described the current situation in ports infrastructure along the Northern Sea Route. The analysis of the statistical data and case studies allows them to evaluate prospects of the basic Arctic industrial and infrastructural projects. They believe that stochastic graph model helps develop the strategy for the development of the NSR as an alternative route to traditional transportation through the Suez Canal. Based on a comparative analysis of the Eurasian traditional routes and the NSR, Anna Kuzaeva considered the advantages and disadvantages of the Northern Sea Route for Trade Logistics. She highly evaluates the prospects of the Arctic route. Kseniya Mitryukova examined the dynamics of freight traffic through the Russian ports in different maritime basins. She thinks that the NSR can be considered as an alternative route for the delivery of goods to the northwestern regions of Russia under the current geopolitical situation. Zhixing Shen focused on advantages of the NSR specifically for China mentioned on guarantees of the security of the supply chain, the reduction in the cost of transportation and the duration of the traffic. He considers three key reasons of using the NSR by Chinese business actors:

stable trading volumes on exchange-traded commodities, regular sea transportation and developed port infrastructure, and longer, all year in prospect, navigation period. Zhixing Shen believes that China's interest is increasingly attracted to this maritime route because of the high chances of improving and strengthening the national economics.

With respect to maritime education and skills after COVID-19, Prof. Cassia Galvao (Texas A&M University Galveston) moderated a panel composed of Prof John Hark (Texas A&M University Galveston), Prof Ana Casaca (WofSPortugal, ISEL and CIMOSM/Centro de Investigação em Modelação e Optimização de Sistemas Multifuncionais), and Dr Leo Robles (Federal University of Maranhao State, Brazil). Maritime Education as a term is oftentimes taken as the training for shipboard officers and engineers. Although they form a fundamental piece of the maritime workforce, there are a significantly increasing number of other maritime professionals composing the workforce in shoreside jobs in multiple functions and levels of maritime logistics organizations. This panel aimed at discussing cases and best practices for training and educating the current and future talents in the maritime industry. The panelists focused on shoreside jobs and the acute need to 1) attract more professionals; 2) provide adequate training for their work responsibilities and; 3) assess the conditions of current online/web-based training programs. Jacquie Young-Hall presented the case of Port Houston and their initiative with students from Middle and Highschool in the Houston area. The Port of Houston Partners in Maritime Education reaches over 1000 students every year and promotes jobs at an entry-level with the fast development of a career in maritime shoreside. Ana Casaca addressed the most updated challenges and trends of maritime education distance and online programs amidst the disruptions caused by Covid-19. Her research has interviewed over 300 maritime professionals and educators in various countries and there is certainly a lot more to be done by educators and stakeholders involved in maritime education. Leo Robles presented the case of Executive Education initially sponsored by the mining company Vale and then expanded to the whole maritime community through various delivery methods. The Executive MBA filled a gap in executive education in the maritime logistics field in Brazil and because it was designed in Portuguese, it also opened up opportunities for other Portuguese-speaking places, like Mozambique. There are several insights from each of these presentations, which we intend to expand in the WCTRS 2023 Conference.

Finally, Prof. Valentin Carlan (University of Antwerp) introduced the Smart Ports barometer. The barometer is an instrument that should allow ports to verify their state

of advance in being innovative. Valentin highlighted the various dimensions that being smart involves.