

IAME

*International
Association of
Maritime
Economists*

CONFERENCE 2022

Impact of COVID-19 on the Maritime Industry : Challenges and Responses

September 14-16

BEXCO, Busan, Republic of Korea

Proceedings



Hosted by



한국해양수산개발원
KOREA MARITIME INSTITUTE



上海国际航运研究中心
Shanghai International Shipping Institute

Organized by



사단
법인 한국도선사협회
Korea Maritime Pilots' Association



Sponsored by





CONTENTS

Welcome Message	1
Organization of the IAME Conference 2022	2
Academic Declaration of Green Maritime Industries toward 2100	10
Floor Plan	11
Program Overview	13
Daily Program	14
Social Program	17
Keynote Speech	18
Special Sessions	24
Parallel Sessions	28
Extended Abstracts & Full Papers	58
Author Index	2484



Welcome Message

The Korea Maritime Institute (KMI) and the Shanghai International Shipping Institute (SISI) are honored to be able to host the International Association of Maritime Economists Conference 2022 (IAME Conference 2022) to be held in Busan, Korea, September 14-16, 2022. Since its foundation in 1992, IAME has developed into an international association with over 300 individual members from every continent and more than 10 corporate members. The Association is officially linked to two leading academic journals within the field: *Maritime Policy & Management* and *Maritime Economics & Logistics*.

KMI has a unique friendship with IAME as it hosted the first IAME Conference in Seoul in 1994 and will celebrate the 30th IAME Conference in Korea in 2022. Under the theme of “Impact of COVID-19 on the Maritime Industry: Challenges and Responses”, the IAME Conference 2022 aims to share the latest information and knowledge on global shipping and trends and reinforce social networks among participants from a range of different fields.

KMI and SISI will invite distinguished professors and researchers to the conference, which will give us the chance to listen to invaluable insights on their research results and advance developments in the global maritime industries. The conference in 2022 will inspire participants from various countries with innovations and new collaborations between academia, government, and industries in response to a rapidly changing society.

We cordially invite you to participate in this conference and hope you have an enjoyable experience in Busan, Korea.

Sincerely,



Jong-Deog Kim
President
Korea Maritime Institute



Jieshu Zhang
Secretary-General
Shanghai International Shipping Institute

Organization of the IAME Conference 2022

Conference Committee

Chair

Jong-Deog Kim	Korea Maritime Institute, Korea
Young-Tae Chang	Inha University, Korea
Jieshu Zhang	Shanghai International Shipping Institute, China

Co-Chair

SangHei Choi	Korea Maritime Institute, Korea
---------------------	---------------------------------

Chair in Korea

Gyei Kark Park	Mokpo National Maritime University, Korea
Jong-Kil Han	Sungkyul University, Korea
Hyuk-Soo Cho	Chungnam National University, Korea
Yang-Kee Lee	Pusan National University, Korea

Co-Chair in Korea

Heesung Yun	Korea Maritime & Ocean University, Korea
Jung Sik Jeong	Mokpo National Maritime University, Korea
Gi-Tae Yeo	Incheon National University, Korea
Suhan Woo	Chung-Ang University, Korea
Yul-Seong Kim	Korea Maritime & Ocean University, Korea
Hong-Gyun Park	Sunchon National University, Korea

Chair in China

Paul TW. Lee	Zhejiang University, China
Jingbo Yin	Shanghai Jiao Tong University, China
Yang Chen	Shanghai Maritime University, China
Qiang Zhang	Shanghai Maritime University, China
Xiwen Bai	Tsinghua University, China
Wenyang Wang	Dalian Maritime University, China

Organization of the IAME Conference 2022

International Scientific Committee

Chair

Kevin Cullinane	University of Gothenburg, Sweden
Young-Tae Chang	Inha University, Korea

Co-Chairs

Man Wo Ng	Old Dominion University, USA
Meng Qiang	National University of Singapore, Singapore
Michael Bell	University of Sydney, Australia

Executive Editor

Ju Dong Park	Gyeongsang National University, Korea
Tae-Goun Kim	Korea Maritime and Ocean University, Korea

Members

Michele Acciaro	Copenhagen Business School, Denmark
Roar Os Adland	Norwegian School of Economics, Norway
Ruth Banomyong	Thammasat University, Thailand
Khalid Bichou	Imperial College London, UK
Mary R. Brooks	Dalhousie University, Canada
Stephen Cahoon	University of Tasmania, Australia
Pierre Cariou	Kedge Business School, France
Ana Cristina Casaca	World of Shipping, Portugal
Gang Chen	World Maritime University, (Shanghai Maritime University), China
Peggy Shu-Ling Chen	University of Tasmania, Australia
Rommert Dekker	Erasmus School of Economics, Netherlands
Michael Doods	University of Brussels, Belgium
Wolfgang Drobotz	University of Hamburg, Germany
Cesar Ducruet	Centre National de la Recherche Scientifique, France

Organization of the IAME Conference 2022

International Scientific Committee

Okan Duru	Nanyang Technological University, Singapore
Sophia Everett	Victoria University, Australia
Xiaowen Fu	Hong Kong Polytechnic University, Hong Kong
Stephen X. Gong	Xi'an Jiaotong - Liverpool University, China
Hans-Dietrich Haasis	University of Bremen, Germany
Hercules Haralambides	Erasmus University Rotterdam, Netherlands
Bruce C. Hartman	California Maritime Academy, USA
Trevor D. Heaver	University of British Columbia, Canada
Olli-Pekka Hilmola	Lappeenranta University of Technology, Finland
Jan Hoffmann	Division on Technology and Logistics, UNCTAD, Switzerland
Kazuhiko Ishiguro	Kobe University, Japan
Haiying Jia	Norwegian School of Economics, Norway
Stavros Karamperidis	University of Plymouth, UK
Manolis G. Kavussanos	Athens University of Economics and Business, Greece
Ioannis N. Lagoudis	University of Piraeus, Greece
Jasmine Siu Lee Lam	Nanyang Technological University, Singapore
Kihwan Lee	Korea Maritime and Ocean University, Korea
Paul TW. Lee	Zhejiang University, China
Taih-Cherng Lirn	National Taiwan Ocean University, Taiwan
Joan Mileski	Texas A&M University at Galveston, USA
Adolf K.Y. Ng	University of Manitoba, Canada
Man Wo Ng	Old Dominion University, USA
Nikos Nomikos	Cass Business School, UK
Theo Notteboom	University of Antwerp, Belgium
Irwin U.J. Ooi	Universiti Teknologi MARA (UiTM), Malaysia
Thanos Pallis	University of the Aegean, Greece
Photis M. Panayides	Cyprus University of Technology, Cyprus
Nikos Papapostolou	Cass Business School, UK

Organization of the IAME Conference 2022

International Scientific Committee

Stephen Pettit	Cardiff University, UK
Andrew Potter	Cardiff University, UK
Harilaos N. Psaraftis	Technical University of Denmark, Denmark
Meng Qiang	National University of Singapore, Singapore
Jean-Paul Rodrigue	Hofstra University, USA
Michael Roe	University of Plymouth, UK
Giovanni Satta	University of Genoa, Italy
Jafar Sayareh	Chabahar Maritime University, Iran
Masato Shinohara	University of Fukuchiyama, Japan
Dongping Song	University of Liverpool, UK
Dong-Wook Song	World Maritime University, Sweden
Henrik Sornn-Friese	Copenhagen Business School, Denmark
Siri Pettersen Strandenes	Norwegian School of Economics, Norway
Wayne K. Talley	Old Dominion University, USA
Koichiro Tezuka	Nihon University, Japan
Vinh V. Thai	RMIT University, Australia
Helen A. Thanopoulou	University of Aegean, Greece
Ioannis Theotokas	University of Piraeus, Greece
Dimitris Tsouknidis	University of Piraeus, Greece
Eddie van De Voorde	University of Antwerp, Belgium
Thierry Vanelslander	University of Antwerp, Belgium
Stefan Voss	University of Hamburg, Germany
Gordon Wilmsmeier	Universidad de los Andes, Colombia
Wesley Wilson	University of Oregon, USA
Eugene Y.C. Wong	Hang Seng University of Hong Kong, Hong Kong
Jingjing Xu	University of the West of England, England
Zaili Yang	Liverpool John Moores University, UK
Zhongzhen Yang	Ningbo University, China

Organization of the IAME Conference 2022

International Scientific Committee

Gi-Tae Yeo	Incheon National University, Korea
Anming Zhang	University of British Columbia, Canada
Michael Bell	University of Sydney, Australia
Tae-Goun Kim	Korea Maritime and Ocean University, Korea
Ju Dong Park	Gyeongsang National University, Korea
Chul-Ho Lee	Korea University, Korea
Suhan Woo	Chung-Ang University, Korea
Sang Yoon Lee	Inha University, Korea
Seung-sik Shin	Chonnam National University, Korea
Nak Hyun Han	Kyungnam University, Korea
Yong-Seok Choi	Sunchon National University, Korea
Chang-Gon Kim	Sunchon National University, Korea
Moonsung Seo	Geumgang University, Korea
Venus Lun	Hong Kong Polytechnic University, Hong Kong Korea Maritime Institute, Korea
Meifeng Luo	Hong Kong Polytechnic University, Hong Kong
Francesco Parola	University of Genoa, Italy
Chen Jihong	Shanghai Maritime University, China
Xiwen Bai	Tsinghua University, China
Joonho Kwon	Pusan National University, Korea
Stephen Jay	University of Liverpool, UK
Hwa Joong Kim	Inha University, Korea
Fabia Ballini	World Maritime University, Sweden
Stefano Ricci	University of Rome La Sapienza, Italy
Leonardo Santiago	Copenhagen Business School, Denmark
Dakshina G. De Silva	Lancaster University Management School, UK
Luca Cocconcelli	UCL, London : London Stock Exchange, UK
Zhi Hua Hu	Shanghai Maritime University, China

Organization of the IAME Conference 2022

International Scientific Committee

Hokey Min	Bowling Green State University, USA
Seong-jong Joo	Air Force Institute of Technology, USA
Hong-Oanh Nguyen	University of Tasmania, Australia
Haedong Jeon	Korea Maritime and Ocean University, Korea
Gunwoo Lee	Hanyang University, Korea
Hyowon Kang	Andong National University, Korea
Minkyu Lee	Pukyong National University, Korea
Dongkeun Ryoo	Korea Maritime & Ocean University, Korea
Young-Joon Seo	Kyungpook National University, Korea
Changsoo Kim	Pusan National University, Korea
Cheng Yang	Shanghai Maritime University, China
Qiang Zhang	Shanghai Maritime University, China
Shiyuan Zheng	Shanghai Maritime University, China
Jieshu Zhang	Shanghai Maritime University, China
Chen Shun	Shanghai Maritime University, China
Ming Yin	Shanghai Maritime University, China
Harry Geerlings	Erasmus University Rotterdam, Netherlands
Abdel El Makhoulfi	Amsterdam University of Applied Sciences, Netherlands
Dong Yang	Hong Kong Polytechnic University, Hong Kong
Kyong-Hoon Choi	Mokpo National Maritime University, Korea
Hyuk-Soo Cho	Chungnam National University, Korea
Hong Gyue Park	Chungnam National University, Korea

Organization of the IAME Conference 2022

Award Sub-Committee

Chair

Wayne K. Talley

Old Dominion University, USA

Dong-Wook Song

World Maritime University, Sweden

Co-Chairs

Jung Hee Cho

Korea Maritime Institute, Korea

Hong Zhen

Shanghai International Shipping Institute (SISI), China

Centennial Sub-Committee

Chair

Hercules Haralambides

Erasmus University Rotterdam, Netherlands

Jan Hoffmann

UNCTAD, Switzerland

Co-Chairs

Trevor D. Heaver

UBC Sauder School of Business, Canada

Jean-Paul Rodrigue

Hofstra University, USA

Theo Notteboom

Ghent University, Belgium

Peggy Shu-Ling Chen

University of Tasmania, Australia

Mike Lai

Hong Kong Polytechnic University, Hong Kong

Gordon Wilmsmeier

Universidad de los Andes, Colombia

Michele Acciaro

Copenhagen Business School, Denmark

Organization of the IAME Conference 2022

Organizing Sub-Committee

Chair

Yong An Park Korea Maritime Institute, Korea

Co-Chairs

Ming Yin Shanghai International Shipping Institute, China

Members

Jung-ho Nam Korea Maritime Institute, Korea
Geun-sub Kim Korea Maritime Institute, Korea
Eon-kyung Lee Korea Maritime Institute, Korea
Byong-wook Ko Korea Maritime Institute, Korea
Dae Young Kim Korea Maritime Institute, Korea
Hyuk Ju Kim Korea Maritime Institute, Korea
Deukhoon Peter Han Korea Maritime Institute, Korea
Hyongmo Jeon Korea Maritime Institute, Korea
Weiling Lu Shanghai International Shipping Institute, China

Secretariat Team

Jaeyoung Huh Korea Maritime Institute, Korea
Sarah Yang Shanghai International Shipping Institute, China

Other Staff

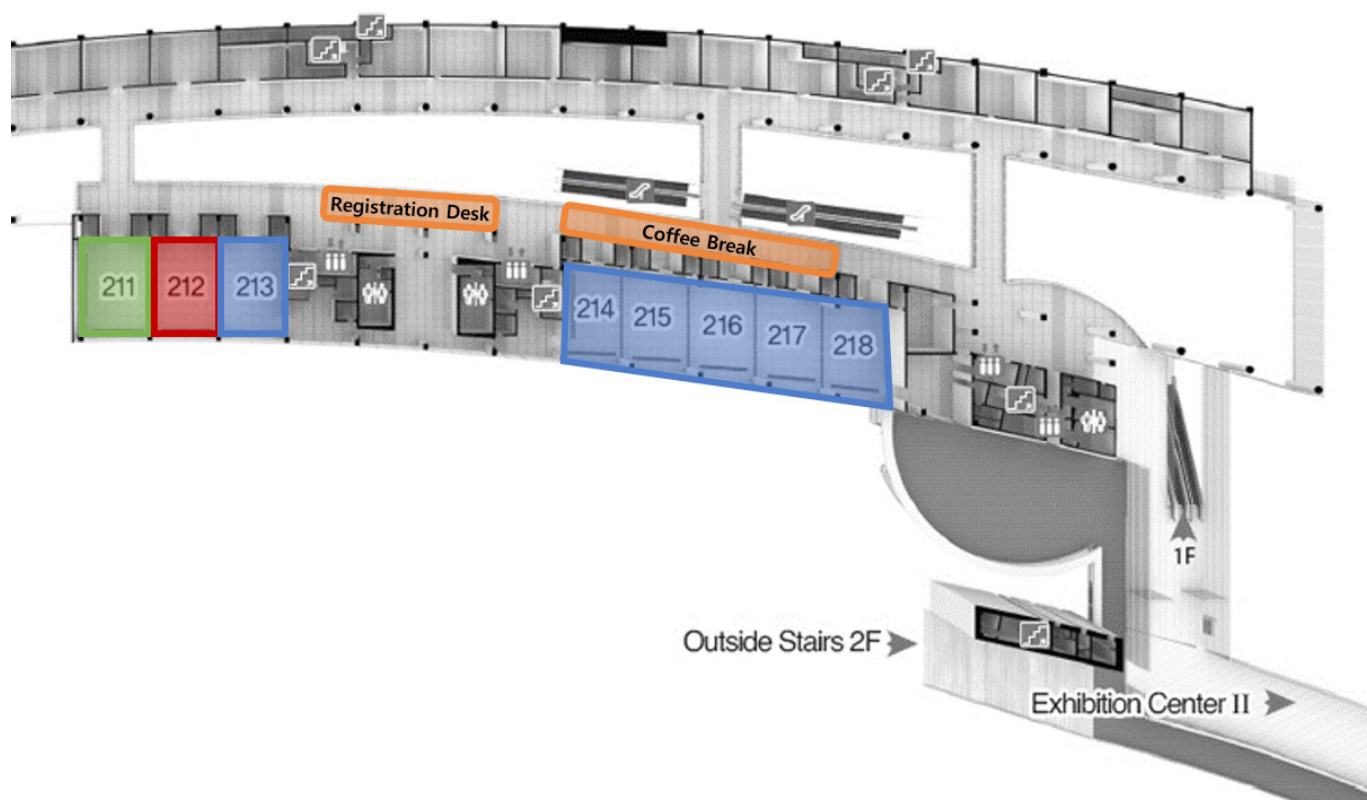
Guhmok Publishing Co.

Academic Declaration of Green Maritime Industries toward 2100

**The Declaration will be finalized at the General Assembly at
September 16, 2022**

Floor Plan

2F, Exhibition Center 1, BEXCO



Location	Date	Program
Lobby	13(Tue)-16(Fri)	Registration Desk
	14(Wed)-16(Fri)	Coffee Break
211	13(Tue)-16(Fri)	Secretariat & Preview Room
212	14(Wed)-16(Fri)	VIP Room, Luncheon Meeting, Council Meeting
213	14(Wed)-16(Fri)	Parallel Session 1
214		Parallel Session 2, The MEL PhD Competition
215		Parallel Session 3
216		Parallel Session 4
217		Parallel Session 5
218		Parallel Session 6

Floor Plan

3F, Exhibition Center 1, BEXCO



Location	Date	Program
314-316	14 (Wed)	Opening Ceremony and Keynote Session
		[Special Session] Prospects and Future of the Northern Sea Route
	15 (Thu)	[Special Session] Development of Cold Chain Information Management and Real-time Monitoring System
		[Special Session] The Foreign Scholar Invitation Seminar
	16 (Fri)	[Special Session] Safety and Security in the Maritime Industries
		Plenary Round Table
		Best Paper Awards & The 30 th Years Anniversary Ceremony
	IAME Annual General Meeting & Closing Conference	

IAME 2022 Program Overview

Time/Date	Sep. 13(Tue.)	Sep. 14(Wed.)	Sep. 15(Thu.)	Sep. 16(Fri.)	
09:00-	Registration Open (6F, KMI)	Registration Open (2F, BEXCO)	Registration Open (2F, BEXCO)	Registration Open (2F, BEXCO)	
10:00-10:30	Port Performance Research Network (PPRN) Workshop (6F, KMI)	Opening Ceremony and Keynote Session	Parallel Sessions	Parallel Sessions	
10:30-11:00					Coffee Break
11:00-11:30			Parallel Sessions		
11:30-12:00					Lunch (B1, The Party Buffet)
12:00-12:30		Parallel Sessions	Lunch (B1, The Party Buffet)		
12:30-13:00				Lunch (B1, The Party Buffet)	[Special Session] Prospects and Future of the Northern Sea Route
13:00-13:30		Parallel Sessions	Plenary Round Table		
13:30-14:00				Parallel Sessions	Best Paper Awards & The 30 th Years Anniversary Ceremony
14:00-14:30		Parallel Sessions	The MEL PhD Competition		
14:30-15:00				Parallel Sessions	IAME Annual General Meeting & Closing Conference
15:00-15:30	Registration Open (2F, BEXCO)	IAME Council Meeting (6F, KMI)			
15:30-16:00			IAME Council Meeting (RM 212)	Gala Dinner (1F, Westin Josun Busan)	
16:00-16:30	Welcome Reception (4F, Centum Hotel)				
16:30-17:00					
17:00-17:30					
17:30-18:00					
18:00-18:30					
18:30-19:00					
19:00-19:30					
19:30-20:00					
20:00-					

Daily Program

September 14(Wed.)

Time/Room	314-316	213	214	215	216	217	218
10:00-10:30	Opening Ceremony and Keynote Session						
10:30-11:00							
11:00-11:30							
11:30-12:00							
12:00-12:30	Lunch						
12:30-13:00							
13:00-13:30							
13:30-14:00							
14:00-14:30	[Special Session] Prospects and Future of the Northern Sea Route	A1-1. Maritime Traffic Theory and Modelling	B1-1. Economic Geography and International Trade	C. Finance (C1-C3)	D1-1. Ports and Economic Development	E1-1. Environmental Impact of the Maritime Sector	F1-1. Corporate Social Responsibility and Governance in the Maritime Industries
14:30-15:00		A1-2. Maritime Traffic Theory and Modelling	B2-1. Data Analytics	G1-1. Ship Safety, Accidents and Regulation	D1-2. Ports and Economic Development	E1-2. Environmental Impact of the Maritime Sector	F2-1. Human Resource Management
15:00-15:30							
15:30-16:00							
16:00-16:30							
16:30-17:00							
17:00-17:30							
17:30-18:00							
18:00-18:30							
18:30-19:00							
19:00-19:30							
19:30-20:00							
20:00-							

Daily Program

September 15(Thu.)

Time/Room	314-316	213	214	215	216	217	218
10:00-10:30		A1-3. Maritime Traffic Theory and Modelling	B3-1. Shipping Market Modelling, Forecasting and Analysis: Freight, Newbuilding, S&P, Demolition	G3-1. Resilience in Trade, Shipping, Ports and Terminals	D2-1. Port Policy, Governance, Competitiveness & Competition	E1-3. Environmental Impact of the Maritime Sector	F3-1. Shipping Regulations and Compliance Requirements, Management and Organization
10:30-11:00							
11:00-11:30							
11:30-12:00	[Special Session] Development of Cold chain Information Management and Real-time Monitoring System	Coffee Break					
12:00-12:30		A2-1. Intelligent Maritime Transport Systems	B3-2. Shipping Market Modelling, Forecasting and Analysis: Freight, Newbuilding, S&P, Demolition	G4-1. Risk Management in Logistics and Global Supply Chains	D2-2. Port Policy, Governance, Competitiveness & Competition	E1-4. Environmental Impact of the Maritime Sector	L1-1. Others**
12:30-13:00							
13:00-13:30		Lunch					
13:30-14:30							
14:30-15:00							
15:00-15:30	[Special Session] The Foreign Scholar Invitation Seminar	A3-1. Maritime Traffic Safety Analysis and Policy	B4-1. Maritime Transport System Analysis and Economic Evaluation	I1-1. Smart Shipping	D2-3. Port Policy, Governance, Competitiveness & Competition	E2-1. Green New Deal for the Maritime Sector	L1-2. Others**
15:30-16:00			B5-1. Maritime Transport Pricing and Economic Regulation				
16:00-16:30		K. Future Challenges (K1-K3)	B6-1. Passenger Shipping – Cruise and Ferry	I2-1. Smart Ports	D3-1. Port Hinterlands and Networks	E2-2. Green New Deal for the Maritime Sector E3-1. Energy and Fuels	L1-3. Others**
16:30-17:00							
17:00-17:30							
17:30-18:00							
18:00-18:30							
18:30-19:00							
19:00-19:30							
19:30-20:00	Gala Dinner						
20:00-							

※ **Gala Dinner Shuttle**

- 18:00-19:00 (every 30 minutes) : Centum Hotel > Westin Josun Busan

- 21:30 (after dinner) : Westin Josun Busan > Centum Hotel

Daily Program

September 16(Fri.)

Time/Room	314-316	213	214	215	216	217	218
10:00-10:30			H1-1. Freight Traffic Theory and Modelling H2-1. Intelligent Freight Transport Systems	I3-1. Smart Logistics	D4-1. Port Performance	E3-2. Energy and Fuels	E5-1. Green Ports
10:30-11:00							
11:00-11:30							
11:30-12:00	Coffee Break						
12:00-12:30	[Special Session] Safety and Security in the Maritime Industries		H3-1. Freight Modal Shift	J. Global Infrastructure (J2-J4)	D4-2. Port Performance D5-1. Maritime Clusters	E4-1. Environmental Innovation in Shipping, Ports and Terminals	
12:30-13:00							
13:00-13:30							
13:30-14:30	Lunch						
14:30-15:00	Plenary Round Table						
15:00-15:30							
15:30-16:00							
16:00-16:30	Best Paper Awards & The 30 th Years Anniversary Ceremony						
16:30-17:00							
17:00-17:30			The MEL PhD Competition				
17:30-18:00							
18:00-18:30	IAME Annual General Meeting & Closing Conference						
18:30-19:00							
19:00-19:30							
19:30-20:00							

Social Program

Welcome Reception

Sep. 13(Tue.) 18:30-22:00 / de Blanc Hall 4F, Centum Hotel(www.ecentumhotel.com)

IAME Conference 2022 attendees are invited to the Welcome Reception at the Centum Hotel. This will be an excellent opportunity to renew old friendships and make new acquaintances.

- * You can sign up for this event when you register for the IAME Conference 2022.
- * To participate in this event please bring the ticket issued with your name badge.
- * [Registration Open] Time: 15:00~18:00 / Location: 2F, Exhibition Center 1, BEXCO

Gala Dinner

Sep. 15(Thu.) 19:30-22:30 / Grand Ballroom 1F, Westin Josun Busan

We would like to invite All Members and Speakers to the Gala Dinner. Enjoy the climax of the IAME Conference 2022 with an excellent dinner and night view of beautiful city, Busan.

- * You can sign up for this event when you register for the IAME Conference 2022.
- * You can pay additional charge for Accompanying Person's Gala Dinner ticket on the Registration Desk.
- * To participate in this event please bring the ticket issued with your name badge.

※ Gala Dinner Shuttle

- 18:00-19:00 (every 30 minutes) : Centum Hotel > Westin Josun Busan
- 21:30 (after dinner) : Westin Josun Busan > Centum Hotel

Keynote Speech



Dr. (Daniel) Seong-Hyeok MOON
Professor, World Maritime University (WMU), SWEDEN

Biography

Doctor MOON currently is a Professor of World Maritime University (WMU). Prof. MOON has earned his PhD degree in Port Economics from the Cardiff University, UK. His area of teaching and research interest has been closely related to ports in terms of management, operations and logistics. He also has a specialty in maritime education and training (MET) based upon his experiences in educating students at Korea Maritime and Ocean University (KMOU). He has got a qualified First-Class Navigation Certificate (non-limited) and been aboard ships more than 10 years including experiences of a chief mate at Hyundai Merchant Marine Co. Ltd (HMM) and a captain at KMOU Training Ship.

For the last nearly 40 years, he has mainly involved in academia: 27 years at KMOU and 11 years as a professor at WMU. He has also had a unique experience more than 3 years in public administration as Minister by taking the helm of the Ministry of Oceans and Fisheries (MOF) in the Republic of Korea (ROK). He invested his decades of experiences into improving how international affairs are handled in the Ministry hoping that it can be more aligned with global trends in a more dynamic fashion.

He has widely published articles and books which are concerned with ports and MET. He has been involved in many research projects for public organisations as well as private companies in terms of maritime and ports activities. He was a member of the Institute of Logistics and Transport and of the Chartered Institute of Transport. He is now a member of the International Association of Maritime Economists (IAME).

Keynote Speech

Smartisation: the key to preempting the future of maritime industry – with particular reference to the restoration of Korean shipping

Seong-Hyeok MOON
(Professor, World Maritime University)

Smartisation

As we usher in a post-COVID era, governments, businesses and international organisations must recognise that we all have stepped in a next stage of innovation under the name of digital transformation. As the Ministry's policy making becomes more globalised based upon digital platforms that support the collection, processing and analyses of vast data through artificial intelligence (AI) and cloud computing, it must become more agile, nimble and smarter in addressing its tasks.

Upon being appointed as the Minister of Oceans and Fisheries in April 2019, I highlighted the importance of the "Smartisation" of oceans and fisheries as one of the top priorities to advance Korea's oceans and fisheries sector and to secure future competitive edges. The two rounds of Strategies that have been undertaken during my term set up milestones for Korea's oceans and fisheries policies over the next decades. The task now is to chart the paths following the milestones while making necessary improvements moving forward in response to changes, broadening and detailing them with technological developments.

What is "Smartisation"?

Industrial Revolution is described as technological changes that introduce novel ways of working and living, thereby triggering a profound transformation in a society. Humanity went through three rounds of Industrial Revolution, each of which brought tectonic shifts not only in industrial landscapes but also in how people live, distribute wealth, create & maintain culture, and interact in societies. Now humankind is in the midst of the 4th Industrial Revolution. The 3rd round, which was called the Information Age, did not go further than converting real-world life into online data, but its successor is realising vast online data into the physical world in the form of automation, optimisation and prediction.

As such, the 4th Industrial Revolution has become the key word for the future competitive edge in all aspects of economic sectors, be it public or private. This is the revolution of smartisation that is triggered by digital technologies

Keynote Speech

such as AI and big data, where hyper-connectivity of networks leads to an exponential growth of data, through which AI automates repetitive learning, discovery and execution. These processes digitalise all economic sectors, thereby blurring the lines between different industries. Smart automation also boosts overall productivity, helping to address issues that arise from population decline and laying new foundations for economic growth.

What is then “Smartisation of oceans and fisheries, which is a critical task to take on?”

By the time I was appointed as the Minister of Oceans and Fisheries in 2019, automation and smart technologies had begun to be sporadically applied to the oceans and fisheries sector. The level of technology was hovering at just level 1 (automation) or 2 (block-chaining of information) at best, lagging behind more advanced competitors. On the policy front, there was no comprehensive strategy to manage the smartisation of each sector, and policy officers were not adequately educated or trained for new technologies. The situation was grimmer in the fisheries sector, where human observations and hand work were still the main tools to monitor coastal erosion and sorting catches for data collection.

It is true that the fields of oceans and fisheries are widely perceived to be conventional and traditional. However, I would assert that considering the inherent features of the oceans and fisheries sectors, i.e., vastness, uncertainty and complexity, the positive effects of application of the 4th Industrial Revolution technologies could be even greater than in other sectors.

With this belief, the first undertaking upon my appointment as the Minister was underpinning “smartisation of oceans and fisheries” as one of my top policy priorities. After 6 months of reviewing, the “Oceans and Fisheries Smartisation Strategy” was established in November 2019 to support the transition of Korea’s oceans and fisheries sector into smarter kind.

Turning oceans and fisheries into critical driving force for the future

The Oceans and Fisheries Smartisation Strategy provides a decade-long roadmap that leads to 2030. It took into consideration of the variables inherent in the 4th Industrial Revolution such as unpredictability of technological development and other relevant uncertainties, as well as practicability elements such as government funding availability and implementation schedules in order to minimise any possible disruptions to private sector-led programmes and projects.

In the process of devising the Strategy, the Ministry held three rounds of consultative meetings of the Committee for

Keynote Speech

the 4th Industrial Revolution in Oceans and Fisheries, comprised of experts and specialists in the fields of oceans and fisheries for their insights and input, and had a lot of internal discussions within the Ministry. The Strategy, under the vision of “a leap forward to become a leader in smart oceans and fisheries,” contains 9 core tasks and 25 action plans across 3 thematic areas: (a) shipping and ports (b) fisheries and (c) marine spatial management. Some of major goals to be achieved by 2030 include (a) 50% of global market share for maritime autonomous surface ship, (b) increasing the coverage of smart fish farms to 50% (compared to 2.5% in 2019), (c) establishing an IoT network of 1,000 port area air quality monitoring points, and (d) shortening the prediction time for marine meteorological disasters to 4 hours (compared to 12 hours in 2019).

Smartisation Strategy and Korean New Deal, particularly during the time of COVID-19 with the perspective of moved-up future

The COVID-19 storm will surely subside at some point, but its ramifications will linger on, transforming the life as we know it. To usher in this new world, the Korean government announced the Korean New Deal Comprehensive Plan in July 2020 to signal a mass transformation aiming at tackling economic challenges brought by COVID-19.

The key words for the Korean New Deal are digital, green, human and regional balance. The Digital New Deal focuses on strengthening the D.N.A. ecosystem; advancing non-contact infrastructure; nurturing hyper-connectivity businesses; and digitalisation of social overhead capitals. The Oceans and Fisheries Smartisation Strategy, which had already been published before the Korean New Deal, served as great reference that supported the implementation of the Digital New Deal, giving the Ministry the upper hand in incorporating oceans and fisheries-related programmes and projects into the New Deal, paving the way for its broader contribution to addressing nation-wide economic challenges stemming from COVID-19.

Korean Shipping: Beyond Restoration and into Global Leadership

Korean shipping, from the viewpoint of the demise of Korea’s top shipping line and the resuscitation & resurrection

By the time the Moon administration was sworn in on the 10th of May 2017, Hanjin Shipping had already gone out of business. Hyundai Merchant Marine, which had barely escaped the jaws of bankruptcy, had to accept the creditors’ demand for restructuring. The Moon administration recognised early on the inherent nature of network dependency

Keynote Speech

of the shipping industry that makes it hard to revive after collapse and is quite different from the shipbuilding industry which at least leaves manufacturing bases even after insolvency. From this recognition came the 5-year plan for shipping on the 5th of April 2018.

The situation was quite grim. The combined revenue of Korean shipping companies, which had been around KRW 39 trillion before the bankruptcy of Hanjin Shipping, dropped to KRW 29 trillion; the capacity of ocean-going carriers was cut in half from 1.05 million TEU to 460,000 TEU; and the market share for the Asian and American routes was reduced from 11% to less than 5%.

The 5-year plan for shipping had the objectives of resuscitating the ‘harmonious industry ecosystem’ through the restoring of the shipping industry, with three major action plans for (a) stable and constant stream of cargo orders (b) low-cost, high-efficiency ships, and (c) support for small and medium shipping liners, thereby reaching the goal of KRW 42 trillion of revenue and 1.1 million TEU of carrier capacity by 2020.

The First Tangible Outcome—the Algeciras, the World’s First 24K TEU Container Ship

With a successful implementation of the 5-year plan for shipping industry, Korea has got the tangible result. On the 23rd of April 2020, the first outcome of the mega containership building programme under the 5-year plan was unveiled, at a naming ceremony of the *HMM Algeciras*, the world’s first 24K TEU containership that can carry as many as 24,000 containers at any given trip. The *Algeciras* can carry 208 more TEU than the *MSC MIA*, which held the title of the world’s largest container ship with 23,756 TEU before the *Algeciras* has come into the picture.

Recovery in revenue and TEU capacities to the pre-Hanjin shipping bankruptcy

With the prompt and timely policy support, major indices such as sales revenue and fleet capacities of ocean-going cargo carriers have now made an early recovery to the level the industry had enjoyed before the bankruptcy of Hanjin Shipping. The revenue has increased by more than KRW 11 trillion from KRW 29 trillion in 2016 to more than KRW 40 trillion in 2021. The carrying capacities of ocean-going cargo containers also grew by 590,000 TEU, from 460,000 TEU in 2016 to 1.05million TEU in 2021, including orderbook TEU. The increase of the TEU capacities, combined with the soaring demand for container shipping during the COVID-19 pandemic, made significant contribution to Korea’s export growth. In 2021, Korea’s annual import and export hit a historic record, exceeding USD 1.2 trillion, among which the export took up USD 644.5 billion, surpassing the historic high of USD 604.9 in 2018. With these stellar accomplishments, Korea has made a leap forward to become the world’s 8th largest trade power.

Keynote Speech

Eyes on the bigger prize: heading towards becoming a global leader in shipping

The book of HMM returned to the black in 21 quarters since the second quarter of 2015. The operating profit of the shipping line in the second quarter of this year also made a huge jump year-on-year, from KRW 218.5 billion deficit to KRW 355.2 billion surplus. The targets in the 5-year plan have been upwardly adjusted, aiming at KRW 51 trillion in sales revenue; 100 million DWT under the Korean flag; and 1.2 million TEU of ocean-going container capacities by 2025.

Couple of years into the global outbreak and spread of COVID-19, trade volumes have increased; the shipping market has turned for the better; and shipping lines are placing large orders for new vessels. The circumstances called for catching up with the recent trends such as port service automation, maritime autonomous surface ship technologies and digitisation of logistics, in which Korea was relatively lagging behind. The MOF launched a government-wide task force for the shipping industry to work on a comprehensive plan to expedite the completion of the rehabilitation of shipping and to nimbly respond to future changes. As a result, a “Strategic Plan for Becoming a Global Leader in the Shipping Industry (i.e., Strategic Plan for Shipping Leadership)” was established on 24th June 2021, which was built on the 5-year plan for shipping with more ambitious goals of KRW 70 trillion in sales revenue; 1.5 million TEU ocean-going container capacities and 140 million DWT under the Korean flag by 2030. The Strategic Plan has the following action plans:

- Robust ship financing and transition into green ships
- Long-term stability in logistics
- Solid support for local ship operators
- Smart shipping and logistics
- Backing-up K-Alliance

Special Sessions

Prospects and Future of the Northern Sea Route

Organized by Korea Maritime Institute

Sep. 14(Wed.) 14:00-16:00 / Rm 314-316

Background

- In October 2021, the 「Polar Activities Promotion Act」 was enacted and implemented to systematically support Korea's polar activities in polar region. According to this, the need to establish policies for comprehensive polar activities regardless of fields, including polar science, polar industry, diplomacy has emerged.
- In this regard, in order to present a definite vision and strategy for Korea's polar activities, it is necessary to prepare the '1st Masterplan for Promotion on Polar Activities('23~'27)' for reviewing existing polar policies and setting feasible projects.
- Northern & Polar Regions Research Division of KMI participating in Masterplan preparing works, will be holding an IAME Special Session in conjunction with specific polar industry fields that can be included in the master plan's projects (building nuclear icebreaker for polar region, development of Northern Sea Route(NSR) and etc.)
- In addition, the results of discussions by experts in Special Session will be helpful in preparing the Masterplan.

Special Sessions

Development of Cold Chain Information Management and Real-time Monitoring System

Organized by Inha University

Sep. 15(Thu.) 11:00-14:00 / Rm 314-316

Background

Jungseok Research Institute of International logistics and Trade(JRI) was selected as the lead agency for 'cold chain status information management and real-time monitoring system establishment technology development' among a total of eight tasks of the Ministry of Land, Infrastructure and Transport's '2021 high value-added convergence logistics delivery and infrastructure innovation technology development project'. JRI would like to organize a special session to share and expand research findings on cold chain monitoring.

China's Cold Chain Policy and Market Analysis

Dr. Jin-Young Hong (JRI), Chen Ying (Inha University)

Status and Issues of Korean Food Cold Chain Industry

Dr. Ha-neul Han(JRI), Ha-Young Ryu(Inha University), Soo-Jung Yang(nLogis)

Pharmaceutical Cold Chain Trends and Major Issues

Dr. Nala Shin (JRI), Mr. Jung-Soo Park (GC Cell)

Blockchain-based Data Platform and Monitoring System for Cold Chain Logistics

Ki-Woong Song (Syszone)

Discussion and Closing

Special Sessions

KMI-KSA The Foreign Scholar Invitation Seminar

Organized by Korea Maritime Institute and Korea Shipowners' Association

Sep. 15(Thu.) 15:00-18:00 / Rm 314-316

Topic: Post COVID-19 Shipping Port Economic Outlook

MC: Hyongmo Jeon, Director, Korea Maritime Institute, Korea

15:00-15:10	Opening Remarks Jong-Deog Kim, President, Korea Maritime Institute, Korea
Foreign Scholars	Topic: Prospects and responses to domestic and international shipping ports after COVID-19
15:10-16:10	Dong-Wook Song, Professor, World Maritime University, Sweden Meng Qiang, Professor, National University of Singapore, Singapore (Webinar) Y.H. Venus Lun, Director, Logistics & Supply Chain MultiTech R&D Centre, Hong Kong Gordon Wilmsmeier, Researcher, Kühne Logistics University, Germany Roar Adland, Professor, NHH Norwegian School of Economics, Norway Kap-Hwan Kim, Professor, Zhejiang University, China
Experts	Topic: Current status and future plans for the shipping and port economy.
16:10-16:40	Byoung-Wook Ko, Director, Korea Maritime Institute, Korea ChanHo Kim, Director, Korea Maritime Institute, Korea Paul Tae-Woo Lee, Professor, Zhejiang University, China
Discussion	Moderator: Young-tae Chang, Chair, Conference Committee of IAME 2022, Korea
16:40-18:00	Panels Jan Hoffmann, Head of Trade Logistics, UNCTAD, Switzerland Jean-Paul Rodrigue, Professor, Hofstra University, USA Thanos Pallis, President, IAME, Greece Seong-Hyeok Moon, Professor, World Maritime University, Sweden
18:00	Closing

Special Sessions

Safety and Security in the Maritime Industries

Organized by Korea Maritime Institute

Sep. 16(Fri.) 12:00-13:30 / Rm 314-316

Moderator: Young Kil Park, Director, Law of the Sea Research Division, KMI

Perspectives on Proposed Low-Impact Shipping Corridors for Safe Navigation in Canadian Arctic Waters

Aldo Chircop, Professor, Schulich School of Law, Dalhousie University, Canada

Civil Liability and Detailed Safety and Security Rules

Andrew Tettenborn, Professor, School of Law, Swansea University, U.K.

Accepting a Cruise Ship whose Passengers/Crew Members were Infected by COVID-19: An Example of the Diamond Princess incident in 2020

Kentaro Furuya, Professor, National Graduate Institute for Policy Studies, Japan Coast Guard Academy

SLOC Issues in East Asia from the Geopolitical and Legal Perspectives

Young-hoon Min, Senior Researcher, KMI and Hyun-wook Jung, Senior Researcher, KMI

Discussion and Closing

Parallel Sessions

September 14(Wed), 14:00-15:30

A1-1. Maritime Traffic Theory and Modelling / Rm 213

Moderator: Morten Svindland, Molde University College, Norway

A1-1-1 **Optimization of Container Ship Route and Speed in Pandemic Environment**
Full Paper Shengtong Guo, Chuanxu Wang, Kai Xu, Jing Wang

A1-1-2 **Creation of a Global Database of Regular Container Lines to Assess the Impact of M&As in the Shipping Industry:**
Full Paper **AI Prediction Models through Unsupervised Machine Learning Methods**
Jerome VERNY, Ouail OULMAKKI, Patrice BOUGETTE, Thierry BLAYAC, Paula AREAL LOSADA, Dhaou GHOU

A1-1-3 **A Model on Competition of Nicaraguan Container Ports**
Full Paper Wilma Veldman

A1-1-4 **Measuring Vessel Capacity Utilization in Short Sea Container Markets**
Full Paper **– Are the Analysis Based on Sound Principles?**
Morten Svindland

A1-1-5 **Liner Shipping Network Model for Dynamic Analysis**
Extended Abstract Xuebin Zhu, Jing Lyu

B1-1. Economic Geography and International Trade / Rm 214

Moderator: Gordon Wilmsmeier, Kühne Logistics University, Germany

B1-1-1 **International Commodity Trade and Economic Growth:**
Full Paper **An Empirical Analysis for Australia (1960 - 2021)**
Asiimirwe Leticia

B1-1-2 **Who Carries the Great Trade:**
Full Paper **Logistics Links between China and the World?**
Kevin X Li, Yi Xiao, Kum Fai Yuen, Yuhan Zhu, Xiao Zhang

Parallel Sessions

September 14(Wed), 14:00-15:30

B1-1-3 **AIS-Based Geographic Analysis and Loading Place Selection Modelling in the Dry Bulk Spot Shipping**
Full Paper
Liwen Murong, Ryuichi Shibasaki, Tran Thi Thu Trang

B1-1-4 **Global Maritime Shipping Network in the Lloyd's Index at the End of the 19th Century**
Extended Abstract
Tomohiro Saito, Kenmei Tsubota, Ryuichi Shibasaki, Cesar Ducruet

C1-1. Modelling and Forecasting Risk in Freight Markets / Rm 215

Moderator: Haiying Jia, Norwegian School of Economics, Norway

C1-1-1 **Risk Forecasting in Shipping Exchange-Traded-Fund (ETF) Markets**
Full Paper
Stergiani Stella Moysiadou, Christos Katris, Manolis Kavussanos

C2-1. Financial Risk Management in Maritime Transportation / Rm 215

Moderator: Haiying Jia, Norwegian School of Economics, Norway

C2-1-1 **Corporate Resilience in Transportation Industry: Evidence from Pandemic Crash and Vaccine Discovery**
Full Paper
Suntichai Kotcharin, Sakkakom Maneenop

C2-1-2 **The Transformation of Shipping Finance Following Regulatory Changes: Focus on the Basel III Reforms**
Extended Abstract
Yoon Gu Chung

C3-1. Financing Investments in Maritime Transportation / Rm 215

Moderator: Haiying Jia, Norwegian School of Economics, Norway

C3-1-1 **The Determinants of Dividend Policy in Shipping Companies**
Full Paper
Andreas Andrikopoulos, Anna Merika, Henry Penikas

C3-1-2 **Sustainable Investment in Shipping: The Case of Container Ecoships**
Extended Abstract
Haiying Jia, Liping Jiang

Parallel Sessions

September 14(Wed), 14:00-15:30

D1-1. Ports and Economic Development / Rm 216

Moderator: Paul Tae-Woo Lee, Zhejiang University, China

D1-1-1 **Developing a Conceptual Model of the 6th Generation Ports and Smart Ports**
 Full Paper Zhaoyu Song, Paul Tae-Woo Lee, Cheng-Wei Lin, Jihong Chen

D1-1-2 **New Rules of Shipping Market Supervision Under RCEP: Characteristics, Challenges and Countermeasures**
 Full Paper Yuanhong Shi

D1-1-3 **Impact Factors on Level of Participation in Port Technology Projects: The Role of Technological Capability**
 Full Paper Qingyao Li, Jasmine Siu Lee Lam

D1-1-4 **Improvement of Port Efficiency in Order to Fit in the Regional Competition: Case Study of Gabon Container Terminal**
 Extended Abstract Yong Sik Oh

D1-1-5 **Development Evaluation of Port-City Relationship: A Case Study of Ningbo**
 Extended Abstract Lu Ke, Yong Sik Oh

D1-1-6 **The Efficiency Evaluation of Maritime Logistics for 29 Major Coastal Countries**
 Full Paper Jeong-Won Choi, Young-Joon Seo, Chang-Soo Kim, Min-Ho Ha, Sung-Woo Lee, A-Rom Kim, Gi-Su Kim

E1-1. Environmental Impact of the Maritime Sector / Rm 217

Moderator: Evangelos Tsioumas, The American College of Greece - Deree, Greece

E1-1-1 **A Study on Vessel Emissions in the Port of Yangon and Navigation Channels Based on AIS Data**
 Full Paper Thuta Kyaw Win, Daisuke Watanabe

E1-1-2 **The Sustainability Conundrum of Mombasa Port**
 Extended Abstract Derrick A. Chondo

Parallel Sessions

September 14(Wed), 14:00-15:30

E1-1-3 **Resilient Maritime Spare Parts Supply Chain through Additive Manufacturing**
Extended Abstract Tan Jie Lun

E1-1-4 **Evaluating the Potential Economic and Societal Impacts of Slow Steaming When Used as the Primary Tool towards Greenhouse Gas Emissions Reduction**
Extended Abstract Seyedvahid Vakili, Fabio Ballini, Alessandro Schönborn, Anastasia Christodoulou, Dimitrios Dalaklis, Aykut I. Ölcer

F1-1. Corporate Social Responsibility and Governance in the Maritime Industries / Rm 218

Moderator: Theodoros Syriopoulos, National And Kapodistrian University of Athens, Greece

F1-1-1 **Strategic Factors Affecting Allocation of Tangible Resources in Maritime Shipping**
Full Paper Christos Sigalas

F1-1-2 **ESG Rating and Reporting: The Case of Shipping**
Extended Abstract Theodoros Syriopoulos, Michael TSATSARONIS, Stavros KARAMPERIDIS, Georgia BOURA

F1-1-3 **How the Landlord Port Model Impacts Corporate Social Responsibility Polices: The Case of Incheon Port Authority**
Extended Abstract Seungmin Lee, Vasco Sanchez Rodrigues, Robert Mason, Ruoqi Geng

September 14(Wed), 15:30-17:00

A1-2. Maritime Traffic Theory and Modelling / Rm 213

Moderator: Morten Svindland, Molde University College, Norway

A1-2-1 **Dynamic Relationship between the Three Industries and Port Container Traffic: The Evidence from the Yangtze River Delta Region, China**
Full Paper Dong Huang, Manel Grifoll, Pengjun Zheng, Hongxiang Feng

A1-2-2 **Operational Productivity and Financial Performance of Pure Transshipment Hubs: An Empirical Investigation on Italian Container Ports**
Full Paper Theo Notteboom, Giovanni Satta, Luca Persico, Bianca Vottero, Alessio Rossi

Parallel Sessions

September 14(Wed), 15:30-17:00

A1-2-3

Full Paper

Disruption Management in Container Shipping Network

Yoonjea Jeong, Gwang Kim, ChaeSoo Kim, ByingO Kang, DoMyung Park, Ilkyeong Moon, HyungRim Choi

A1-2-4

Extended Abstract

Increasing the Market Share of Sustainable Cruise Ships via Optimal Pricing and Advertising Strategies

Ziting XU, Adolf K.Y. NG, Thanos Pallis

A1-2-5

Full Paper

**The Vindication of a Definition:
Distinguishing Liner and Bulk Shipping Post COVID-19**

Helen A. Thanopoulou, George A. Gratsos, Albert E. Veenstra

B2-1. Data Analytics / Rm 214

Moderator: Kap-Hwan Kim, Zhejiang University, China

B2-1-1

Full Paper

**Regional Analysis of Oil Seaborne Trades:
A Focus on Africa**

Mawuli Afenyo, Daniel Ohene Yeboah, Livingstone Divine Caesar, Francis Yao Adzraku, Twum Antwi-Agyakwa

B2-1-2

Full Paper

Analysis of CIF/FOB Ratio in Reconciliation of Trade Statistics

Hiroyuki KOSAKA

B2-1-3

Extended Abstract

**Cascading on the Dynamic Liner Shipping Industry, the Last Decade. Global Analytic Methodology, Case Study:
West Coast South America to the Far East**

Christoph K. G. Schaar, Alejandra M. Gomez Paz, Gordon Wilmsmeier, Ricardo J. Sánchez

B2-1-4

Extended Abstract

**Exports of Sea Transport Services:
A Review of International Balance of Payments Compilation Methodologies**

Stelios Panagiotou

Parallel Sessions

September 14(Wed), 15:30-17:00

D1-2. Ports and Economic Development / Rm 216

Moderator: Paul Tae-Woo Lee, Zhejiang University, China

D1-2-1 **Ways to Improve the Efficiency of Container Terminals**

Full Paper

-A Study Based on SBM-DEA and Bootstrapped Truncated Regression

Yuxin Zhang, Oh Kyoung Kwon, Young-Tae Chang

D1-2-2

Full Paper

**A Method for Identifying Shipping Schedule Cancellations through AIS Data:
An Application to the Far East –Europe Route during the Covid-19 Pandemic**

Carlos Pais Montes, Jean-Claude Thill, David Guerrero

D1-2-3

Extended Abstract

**How do Three Sectors of Industries Impact Container Traffic? The Yangtze River Delta
Case in China**

Dong Huang, Manel Grifoll, Hongxiang Feng, Pengjun Zheng

D1-2-4

Extended Abstract

The Use of Land as an Exhaustible Resource in Ports

Arènso Bakker, Michele Acciaro

D1-2-5

Full Paper

**Performance Analysis and Benchmarking of Container Ports Operating in Lower-
Middle-Income Countries:**

A DEA Approach

Caleb Danladi Bako, Sarah Tuck, Panagiotis Tziogkidis, Lijun Tang, Chukwuneke Okorie

D4-1-5

Extended Abstract

Container Terminals and the Footprint of Globalization

Jean-Paul Rodrigue

E1-2. Environmental Impact of the Maritime Sector / Rm 217

Moderator: Evangelos Tsioumas, The American College of Greece - Deree, Greece

E1-2-1

Full Paper

Leveraging Sustainable Options to Achieve Cost Savings in a Military Supply Chain

Benjamin D. Miller, Benjamin J. Johnis

Parallel Sessions

September 14(Wed), 15:30-17:00

E1-2-2

Full Paper

Towards a Prioritization of Alternative Energy Sources for Sustainable Shipping in Developing Countries:

A Hybrid Multi-Criteria Decision-Making Approach

Ziaul Haque Munim, Mohammed Mojahid Hossain Chowdhury, Hasan Mahbub Tusher, Theo Notteboom

E1-2-3

Full Paper

Reducing Emissions from Ships:

The Costs and Benefits of Emission Abatement Approaches

Ketan Gore, Patrick Rigot-Müller, Joseph Coughlan

E1-2-4

Extended Abstract

Environmental Management Tool for Maritime Transportation and Ports

Olli-Pekka Brunila, Tommi Inkinen, Vappu Kunnaala-Hyrkki

E1-2-5

Extended Abstract

Potential Alternative Fuel Pathways for Compliance with the ‘FuelEU Maritime Directive’

Anastasia Christodoulou, Kevin Cullinane

E1-2-6

Extended Abstract

Green Projects & CSR Analysis:

The Case of Norwegian Shipping Companies

Georgios Christakis, Maria Opsimouli, Dimitris Gavalas

F2-1. Human Resource Management / Rm 218

Moderator: Stavros Karamperidis, University of Plymouth, United Kingdom

F2-1-1

Full Paper

Master in Maritime Logistics:

An Industry-Driven Design

Marco Sernaglia, Helena M. L. Carvalho, Pedro Água, Armindo Frias, Manuel Carrasqueira

F2-1-2

Full Paper

A Systematic Literature Review of Behavioral Investment in Shipping

Katerina Voutsina, Vangelis Tsioumas

F2-1-3

Full Paper

Crew Management in the Age of Pandemic

Iakovou Maria-Anastasia, Mylona Maria, Chatzigiannis Panagiotis, Chamzallari Migkena, George K. Vaggelas

Parallel Sessions

September 14(Wed), 15:30-17:00

F2-1-4

Full Paper

**The RoRo Shipping Game:
Eco-Efficient Shipping via Simulation Based Training**
Niels Gorm Maly Rytter, Nicolai Emil Hinge, Beizhen Jia

F2-1-5

Extended Abstract

Evaluating the Effect of Emotional Labor on Employees' Turnover Intention in Ocean Freight Forwarders
Ching-Chiao Yang, Yuan-Liang Chang, Chien-Ting Lin

G1-1. Ship Safety, Accidents and Regulation / Rm 215

Moderator: Monica Canepa, World Maritime University, Sweden

G1-1-1

Full Paper

Study on Rupture Probability of LNG Tank for LNG Fueled Ships Comparing with LNG Carriers
Haocheng Cai

G1-1-2

Full Paper

A Bayesian Network-Based TOPSIS Framework to Dynamic Control Pirate Hijacking Risk
Hanwen Fan, Jing LV, Zheng Chang

G1-1-3

Full Paper

**Towards Safe Navigation Environment:
The Imminent Role of Spatio-Temporal Pattern Mining in Maritime Piracy Incidents Analysis**
Huanhuan Li, Zaili Yang

G1-1-4

Full Paper

Disaster Data-Driven Climate Change Risk Index for Ports
Mark Ching-Pong Poo, Zaili Yang, Eric Leung

Parallel Sessions

September 15, 10:00-11:30

A1-3. Maritime Traffic Theory and Modelling / Rm 213

Moderator: Ziaul Haque Munim, University of South-Eastern Norway, Norway

A1-3-1 **Contribution of the Cruise Industry to Economy in the Post-Epidemic Era of COVID-19: A Case Study of Dalian**
Full Paper Jiahui JI, Qiong WU

A1-3-2 **Long-term Forecasting of Port Trade Volume of Steel Scrap**
Full Paper Seong-Hyun Cho

A1-3-3 **Schedule Stability on the Trans-Pacific Trade Lane**
Extended Abstract Michael G. H. Bell, Ze Wang, Kam-Fung Cheung, Shengda Zhu

B3-1. Shipping Market Modelling, Forecasting and Analysis: Freight, Newbuilding, S&P, Demolition / Rm 214

Moderator: Roar Adland, NHH Norwegian School of Economics, Norway

B3-1-1 **Determining Shipping Cycle by Supply/Demand Ratio and Markov Regime Switching**
Full Paper Koichiro Hayashi

B3-1-2 **How Has the COVID-19 Pandemic Affected Shipping Prices: Evidence from Capesize Shipping Market Based on AIS Data**
Full Paper Shun Chen, Xingjian Wang, Xiangyan Meng, Jinhong Mi

B3-1-3 **Understanding the Resilience of Bulk Shipping Markets to COVID-19**
Full Paper Hyun-Tak Lee, Heesung Yun

B3-1-4 **Has IMO 2020 Changed Bulk Shipping?**
Extended Abstract Roar Adland, Michael E. Snekkenes, Marius Bustgaard

B3-1-5 **Factors Influencing Stochastic Fluctuation in Shipping Freight Rate**
Extended Abstract Masahiro Ishij, Motokazu Ishizaka, Koichiro Tezuka

Parallel Sessions

September 15, 10:00-11:30

D2-1. Port Policy, Governance, Competitiveness & Competition / Rm 216

Moderator: David Guerrero, Université Gustave Eiffel, France

D2-1-1 **Proposal of an Analytical Methodology for Assessing Similarities/Differences between Ports**
Full Paper
Renaud Di Francesco, Françoise Bahoken

D2-1-2 **Merger of Port Companies, Impact on Concentration/Deconcentration and Strategy towards Post Covid-19 Pandemic: Cases of Indonesia and Japan**
Full Paper
Bahana Wiradanti, Stephen Pettit, Masato Shinohara, Febrian Aris Rosadi

D2-1-3 **Port Capacity-Sharing Decisions in the Post COVID-19 Pandemic Era**
Full Paper
Gang Dong, Masahiro Ishii, Shiyuan Zheng, Koichiro Tezuka, Paul Tae-Woo Lee

D2-1-4 **How Should Ports Share Risk of Natural Disasters? Analytical Modelling and Implications for Adaptation Investments**
Full Paper
Ryo Itoh, Anming Zhang

D2-1-5 **Towards a Next Phase of Port Reform in Africa: An Analysis of Context, Drivers, Conditions and Options**
Extended Abstract
Adekola Oyenuga

D2-1-6 **Port-City Relationship and the UN Sustainable Development Goals: A Content Analysis of the Literature**
Extended Abstract
Cassia Bomer Galvao, Z. Denise Forester, Leo T. Roblesc

E1-3. Environmental Impact of the Maritime Sector / Rm 217

Moderator: Christopher Dirzka, Copenhagen Business School, Denmark

E1-3-1 **A Critical Review of Green Liner Shipping Route Planning under Seasonal Container Demand**
Full Paper
Chi Chien Gooi, Wei Zhang, Wenming Shi, Hadi Rezaei Vandchali

Parallel Sessions

September 15, 10:00-11:30

- E1-3-2** **Behavior Analysis of Individual Shipping Company under Maritime Emission Trading Scheme and LNG-Fueled Vessels Deployment**
 Full Paper Ah-Hyun Jo, Young-Tae Chang, Taesung Hwang
- E1-3-4** **Green Contracting Problem In Liner Shipping**
 Extended Abstract Lingyu Zhang, Christopher Dirzka
- E1-3-5** **Does the Dry Port Help or Harm the Hinterland Environment?**
 Extended Abstract Jiahui Li, Sangyoon Lee

F3-1. Shipping Regulations and Compliance Requirements, Management and Organization / Rm 218

Moderator: Niels Gorm Maly Rytter, University of Southern Denmark, Denmark

- F3-1-1** **Machine Learning in Regulatory Compliance Software Systems: An Industrial Case Study (Maritime Industry)**
 Full Paper Maryam Rezaei, Lawrence Henesey, Alexandr Silonosov
- F3-1-2** **Evaluating Maritime Simulators using a Hybrid Multi-Criteria Decision-Making Approach**
 Extended Abstract Hasan Mahbub Tusher, Ziaul Haque Munim, Salman Nazir
- F3-1-3** **Efficient and Explainable Ship Selection Approaches in Port State Control Inspection**
 Extended Abstract Ran Yan, Shuaian Wang

G3-1. Resilience in Trade, Shipping, Ports and Terminals / Rm 215

Moderator: Salamat Ali, Commonwealth Secretariat, United Kingdom

- G3-1-1** **The Impacts of COVID-19 on the Cruise Industry Based on an Empirical Study in China**
 Full Paper Jingen Zhou, Shu-Ling (Peggy) Chen, Wenming (Wendy) Shi, Son Nguyen
- G3-1-2** **A Conceptual Framework for Climate Change Adaptation and Its Application to the Australian Bulk Grain Shipping System**
 Full Paper Ronald Ssali, Peter Dzakah Fanam, Peggy Chen, Stephen Cahoon

Parallel Sessions

September 15, 10:00-11:30

G3-1-3 **Liability Limitation in Maritime Accidents**
Full Paper Snehal Agarwal

G3-1-4 **A Port System Resilience Analysis during the COVID-19 Pandemic:
Based on AIS Data**
Full Paper Lishan Liu, Kai Xu

September 15, 12:00-13:30

A2-1. Intelligent Maritime Transport Systems / Rm 213

Moderator: Mahdi Ghesmi, LLoyd's Regitser EMEA, Germany

A2-1-1 **Extraction and International Comparison of Bunkering Operations Based on AIS Data**
Full Paper Eisuke Watanabe, Ryuichi Shibasaki

A2-1-2 **Advances in Assessment of Structural Response of Container Stacks**
Full Paper Mahdi Ghesmi

A2-1-3 **An Approach towards Risk-Based Design of Autonomous Ship Systems**
Extended Abstract Meriam Chaal, Ahmad Bahootoroody, Sunil Basnet, Osiris A. Valdez Banda, Floris
Goerlandt

A2-1-4 **Shipping 4.0 Enhancing Maritime Operations:
A Bibliometric Validation**
Extended Abstract Kelly Gerakoudi-Ventouri

B3-2. Shipping Market Modelling, Forecasting and Analysis: Freight, Newbuilding, S&P, Demolition / Rm 214

Moderator: Roar Adland, NHH Norwegian School of Economics, Norway

B3-2-1 **Deep Neural Network' Architectures for Momentary Forecasting in Dry Bulk Markets
Robust in COVID-19 Impact**
Full Paper Sang Hyeok Lee

Parallel Sessions

September 15, 12:00-13:30

B3-2-2

Full Paper

**Bayesian Forecasting in Shipping Markets:
Stochastic Search Variable Selection Approach**

Byoung-Wook Ko, Young-Tae Chang, Gun-Woo Choi, Eun-Soo Kim

B3-2-3

Extended Abstract

**Volatility Transmission Between Container and Dry Bulk Freight Markets During
COVID-19 Pandemic**

Reha Memişoğlu, Seçil Sigal

B3-2-4

Extended Abstract

**Determining Bargaining Power between Ship Operators and Charters in Iron Ore
Freight Markets**

Satya Sahoo, Liping Jiang, Dong-Wook Song

D2-2. Port Policy, Governance, Competitiveness & Competition / Rm 216

Moderator: Carlos Pais-Montes, Université Gustave Eiffel, France

D2-2-1

Full Paper

**Determinants of the Total Logistics Cost in Ports and Its Hinterland from the Users'
Perspective**

Khandaker Rasel Hasan, Wei Zhang, Wenming Shi

D2-2-2

Full Paper

The Impact of China's Cabotage Relaxation Policy

Ming Jin, Huijuan Zhai

D2-2-4

Extended Abstract

**Extended Abstract of "Seaport Adaptation to Climate Change-Related Disasters under
Cooperation with Dry Port"**

Xiangru Wu, Yilin Chen, Shiyuan Zheng, Xiaowen Fu, Kun Wang

D2-2-5

Extended Abstract

**Cooperation and Competition between Three Ports with Different Cooperative
Motivation**

Hoshi Tagawa, Tomoya Kawasaki, Shinya Hanaoka

D2-3-4

Extended Abstract

**Exploring the Linkages of Port Integrity Commitments and Corruption Risks in
Different Shipping Markets**

Paraskevi Kladaki, Athanasios A. Pallis

Parallel Sessions

September 15, 12:00-13:30

D2-3-5

Extended Abstract

**Port Governance Regionalization:
Types, Drivers, Impediments and Implications of Port Authorities Mergers**
Theo Notteboom, Athanasios A. Pallis, Jean-Paul Rodrigue

E1-4. Environmental Impact of the Maritime Sector / Rm 217

Moderator: Tommi Inkinen, University of Turku, Finland

E1-4-1

Full Paper

The Journey of Sustainable Shipping
Peter J. Stavroulakis, Periklis Prousaloglou, Maria Kokkinogeni, Vangelis Tsioumas

E1-4-2

Full Paper

The IUU Fishing Actions and Selat Lampa Marine Industry Challenges in Natuna Islands, Indonesia
Khodijah Ismail, Firmansyah Kusasi

E1-4-3

Extended Abstract

What Makes Seaports More Committed to Air Quality? A Review of Key Motivations, Drivers and Barriers
Flóra Zsuzsanna Gulyás, Aseem Kinra

E1-4-4

Extended Abstract

Dry Bulk Vessels Time Charter Equivalent Optimization Based on Speed and Environmental Regulations
Tamara Apostolou, Ioannis N. Lagoudis, Ioannis N. Theotokas

E1-4-5

Extended Abstract

Effect of IMO Market-Based Measures on Korean Shipping Companies
Hanna Kim, Sunghwa Park

G4-1. Risk Management in Logistics and Global Supply Chains / Rm 215

Moderator: Salamat Ali, Commonwealth Secretariat, United Kingdom

G4-1-1

Full Paper

Factor Influencing of the Seaport-Fulcrum Supply Chain Risk Disruption in Indonesia using Rough Set and Multivariate Analysis of Variance
Muhammad Reza Do. Bagus, Shinya Hanaoka

G4-1-2

Full Paper

Impact Analysis of COVID-19 Epidemic on Container Liner Shipping Market: A Perspective from Automatic Identification System (AIS)
Kai Xu, Zijun Huang, Ming Yin, Shengtong Guo, Xin Sun, Wenxuan Zhang, Maayuk-okpok Anastasia Ojong

Parallel Sessions

September 15, 12:00-13:30

G4-1-3

Full Paper

Construction and Risk Assessment of Import Cold Chain Logistics Safety Supervision System (ICCL-SSS) Based on Entropy Weight Matter Element Extension Model-Case of Shanghai, China

Qiang Fu, Yu-rou Sun, Nuan Wu

G4-1-4

Extended Abstract

Container Shipping Sustainability-Related Risk Assessment

Yusheng Zhou, Kum Fai Yuen

L1-1. Others / Rm 218

Moderator: Saeyeon Roh, University of Plymouth, United Kingdom

L1-1-1

Full Paper

Harnessing Maritime Trade for Post-COVID Recovery and Building Resilience in the Commonwealth

Salamat Ali, Ganeshan Wignaraja, Brendan Vickers

L1-1-2

Full Paper

Maritime Trade and Economic Development in North Korea

Cesar Blaise Ducruet, In Joo Yoon

L1-1-3

Full Paper

Complex Network Topology of the Low-Cost Air Passenger Transport Network

Maneerat Kanrak, Yui-yip Lau, Xiaowen Fu, Xavier Ling, Saksuriya Traiyarach

L1-1-4

Extended Abstract

An Analysis of Port Service Quality and Customer Satisfaction: Application of Fuzzy-Set Qualitative Comparative Analysis

Saeyeon Roh, Vinh Thai, Hyunmi Jang, Mohamed Haddoud, Adah Emmanuel Onjewu

L1-1-5

Extended Abstract

Circular Developments of Maritime Ports in Europe: A Semi-Systematic Review of the Current Situation

Julian Barona Motlak

L1-1-6

Extended Abstract

Who Leads Humanitarian Logistics and Supply Chain Research?

Ah-Hyun Jo, Enny Vöge, Young-Tae Chang

Parallel Sessions

September 15, 15:00-16:30

A3-1. Maritime Traffic Safety Analysis and Policy / Rm 213

Moderator: Ziaul Haque Munim, University of South-Eastern Norway, Norway

A3-1-1

Full Paper

Covid-19 and Future Pandemics:

A Robust Model Describing Propagation of Virus in Maritime Contexts, Prior to Availability of Vaccines

Renaud Di Francesco

A3-1-2

Full Paper

Predicting Maritime Accidents Using Automated Machine Learning

Ziaul Haque Munim, Michael André Sørli, Hyungju Kim

A3-1-3

Extended Abstract

Principles and Best Practices for Supply Chain Resiliency

Maria Grypaïou, Paula deWitte, Joan Mileski

B4-1. Maritime Transport System Analysis and Economic Evaluation / Rm 214

Moderator: Ryuichi Shibasaki, The University of Tokyo, Japan

B4-1-1

Full Paper

Examining the Impact of the COVID-19 Pandemic on Container Carriers

Sunil Hwang, Seong-Jong Joo

B4-1-2

Full Paper

Mega Vessels

-Mega Error?

Ulrich Machow

B4-1-3

Full Paper

Container Terminal Automation:

Assessment of Drivers and Benefits

Geraldine Knatz, Theo Notteboom, Athanasios A. Pallis

B5-1. Maritime Transport Pricing and Economic Regulation / Rm 214

Moderator: Ryuichi Shibasaki, The University of Tokyo, Japan

B5-1-1

Full Paper

Disentangling Cartel Dissolution:

The Case of the 1980s' Container Crisis

Suguru Otani, Takuma Matsuda

Parallel Sessions

September 15, 15:00-16:30

D2-3. Port Policy, Governance, Competitiveness & Competition / Rm 216

Moderator: Bahana Wiradanti, PT Pelabuhan Indonesia, Indonesia

D2-3-1 **Understanding Core Determinants in LNG Bunkering Port Selection**
 Full Paper Tsendkhuu Nyamjav, Young-Joon Seo, Min-Ho Ha

D2-3-2 **Assessment of the Impact of the EU Emission Trading System (ETS) in the Mediterranean Sea:**
 Full Paper **Case of Container Liner Route of the Barcelona Port**
África Marrero, Guillermo Solina, Javier Garrido, Sergi Saurí

D2-3-3 **Container Port System Evolution in the Greater Bay Area:**
 Full Paper **Functional Differentiation**
 Xiaoxin Huang, Dong Yang, Mike Lai, Venus Lun

E2-1. Green New Deal for the Maritime Sector / Rm 217

Moderator: Sihyun Kim, Korea Maritime and Ocean University, Republic of Korea

E2-1-1 **Self-Generating Power for Sustainable Energy Use in a Vessel via the Ballast Water Treatment System**
 Full Paper Jeho Hwang, Sang Hyung Park, Sohyun Yun, Sihyun Kim

E2-1-2 **Impacts of the Inclusion of the Maritime Sector in the EU ETS:**
 Full Paper **A Transshipment Hub Relocation Case Study**
Sotiria Lagouvardou, Harilaos N. Psaraftis

E2-1-3 **Analysis of the MRV Database and the Evolution of the EU Carbon Price Over the Years:**
 Extended Abstract **How do External Factors Affect the Inclusion of Shipping in the EU ETS?**
Anastasia Christodoulou, Dimitrios Dalakli, Aykut I. Ölcer, Peyman Ghaforian Masodzadeh

E2-1-4 **On the Potential Environmental Impact of Including Maritime Shipping in the EU ETS**
 Extended Abstract Rasmus Parsmo, Julia Hansson, Erik Fridell

Parallel Sessions

September 15, 15:00-16:30

- E2-1-5** **Early Assessment of the Effects of Including Shipping in the EU Emission Trading System**
 Extended Abstract
Lars Zetterberg, Johan Rootzén
- E2-1-6** **European Union Environmental Policy and the Competitiveness of Sea Transport of Unitized Cargo**
 Extended Abstract
Tomi Solakivi, Aleksii Paimander, Lauri Ojala

I1-1. Smart Shipping / Rm 215

Moderator: Christos Kontovas, Liverpool John Moores University, United Kingdom

- I1-1-1** **A Systematic Literature Review of Blockchain Application in Maritime Supply Chain: The TOE Framework**
 Full Paper
Sanghoon Shin, Yingli Wang, Stephen Pettit, Wessam Abouarghoub
- I1-1-2** **Maritime Autonomous Surface Ships (MASS): Current Regulations and Regulatory Challenges**
 Full Paper
Chia-Hsun Chang, Christos Kontovas, Zaili Yang, Stavros Karamperidis, Shuen-Tai Ung, Chi-Chang Lin
- I1-1-3** **Comparison of the Operating Time, Energy Saving, and Carbon Reduction Benefits of Manned and Unmanned Ships on a Short-Sea Shipping Route**
 Full Paper
Yi-Chih Yang, Nguyễn Thị Trang
- I1-1-4** **Data Driven Global Container Port Turnover Rate Assessment: Implication for Port Practice and Policy**
 Full Paper
Dong Yang, Shiguan Liao, Xiwen Bai, Jinxian Weng
- I1-1-5** **Evaluating the Social Acceptance of Autonomous Ferries: A User Perspective**
 Full Paper
Chi-Chang Lin, Christos Kontovas, Zaili Yang, Stavros Karamperidis, Shuen-Tai Ung, Chia-Hsun Chang
- I1-1-6** **Spatial and Temporal Traffic Density Analysis for Implementing the Maritime Autonomous Surface Ships' Coastal Navigation Testbed**
 Extended Abstract
 Taewoong Hwang, Ik-Hyun Youn, Taemin Hwang, Hyoseon Hwang

Parallel Sessions

September 15, 15:00-16:30

L1-2. Others / Rm 218

Moderator: George Vaggelas, University of the Aegean, Greece

L1-2-1

Full Paper

**Cyber-MAR Dynamic Awareness Raising
– An Integrated Maritime Cyber Risk Management Approach**
M. Canepa, R. Hopcraft, S. Karamperidis, F. Ballini

L1-2-2

Full Paper

Modeling and Performance Analysis of Loading Operations at a Seaport Automobile Terminal
Branislav Dragović, Romeo Me trović, Nenad Zrnić, Stratos Papadimitriou, Andro Dragović, Mauro Petranović

L1-2-3

Extended Abstract

**Port Investments in Europe under the Belt and Road Initiative:
A Geopolitical Perspective**
Konstantinos Karagiannis, Stavros Karamperidis, George K. Vaggelas

L1-2-4

Extended Abstract

**Measurement Scales for Assessing the Maritime Logistics Performance:
A Exploratory Factor Analysis**
Wahidul Sheikh, Mohammed Mojahid Hossain Chowdhury, Kazi Khaled Mahmud

September 15, 16:30-18:00

B6-1. Passenger Shipping – Cruise and Ferry / Rm 214

Moderator: Geraldine Knatz, University of Southern California, United States

B6-1-1

Extended Abstract

Impact of the COVID Pandemic on the Icelandic Cruise Ports
Majid Eskafi, Poonam Taneja, Gudmundur F. Ulfarsson

B6-1-2

Extended Abstract

Social Media Perception of COVID-19 Outbreaks on Cruise Tourism
Babajide Abubakr Muritala, Ana Beatriz Hernández-Lara, Maria-Victoria Sánchez-Rebull

B6-1-3

Extended Abstract

**Contribution of the Cruise Industry to Economy in the Post-Epidemic Era of COVID-19:
A Case Study of Dalian**
Jiahui Ji, Qiong Wu

Parallel Sessions

September 15, 16:30-18:00

B6-1-4
Extended Abstract **Cruise Pricing Strategy for Profit Maximization:
A Game Theory Approach**
Kassiani Stathaki, George K. Vaggelas, Dimitrios Gavalas, Michael Tsatsaronis

B6-1-5
Extended Abstract **COVID-19 Impact on the Global Cruise Industry:
Financial Performance Evaluation**
Michael Tsatsaronis, Theodore Syriopoulos, Martha Gkorila

D3-1. Port Hinterlands and Networks / Rm 216

Moderator: David Guerrero, Université Gustave Eiffel, France

D3-1-1
Full Paper **Implications of COVID-19 on the Us Container Port Distribution System:
Import Cargo Routing by Walmart and Nike**
Pierre Cariou, Theo Notteboom

D3-1-2
Full Paper **Spatial Spillover Effects of the Hinterland on Maritime Connectivity:
The Case of Europeans Ports**
Gabriel Figueiredo de Oliveira, Rania Tassadit DIAL

D3-1-3
Full Paper **The Applicability of Social Network Analysis to Port-Hinterland Connectivity
Measurement with Reference to Container Ports**
Ajay Deshmukh, Dong-Wook Song

D3-1-4
Full Paper **Port Competition in Contestable Hinterlands:
The Case of Preferential Relationships and Barrier Effects in Central Europe**
David Guerrero, Jean-Claude Thill

D3-1-5
Extended Abstract **Port City in Spatial Transition:
A Theory and Case on Culture-Based Waterfront Regeneration**
Jaehee Hwang, Yelim Kim, Changwoo Kang

Parallel Sessions

September 15, 16:30-18:00

E2-2. Green New Deal for the Maritime Sector / Rm 217

Moderator: Tomi Solakivi, University of Turku, Finland

- E2-2-1**
Full Paper
The Role of Maritime Transport for Transportation of Scrap and Plastic Recyclates in Networks of Recycling Plants
Lieven DEMEESTER, [Joyce LOW](#)
- E2-2-2**
Extended Abstract
The Impact of EU-ETs on RoRo and RoPax Shipping
[Jonas Flodén](#), Zeeshan Raza, Johan Woxenius, Anastasia Christodoulou
- E2-2-3**
Extended Abstract
**Impact of Implement of IMO Environmental Regulations and EU Carbon Border Tax Deduction Effect:
Influence of Ship's Eco-Fueling on EU CBAM Deduction**
[Sung Woo Ryoo](#)

E3-1. Energy and Fuels / Rm 217

Moderator: Tomi Solakivi, University of Turku, Finland

- E3-1-1**
Full Paper
**Boeing Decarbonization and Sustainability in Maritime Industry:
Blending Innovation and Emission Reduction**
[Prachi Ugle](#)
- E3-1-2**
Extended Abstract
Enhancing the Role of Ports in the Energy Value Chains
[Michele Acciaro](#), Henrik Sornn-Friese
- E3-1-3**
Extended Abstract
**A Review on Port Energy Management as a Holistic Approach:
Energy Efficiency, Energy Conservation and Renewable Energy**
Abdel Ganir Njikatoufon, Luca Persico, [Giovanni Satta](#), Bianca Vottero
- E3-1-4**
Full Paper
**Decarbonization Technology Responsibility to Gender Equality in the Shipping Industry:
A Systematic Literature Review and New Avenues Ahead**
[Assunta Di Vaio](#), Anum Zaffar, Daniel Balsalobre-Lorente

Parallel Sessions

September 15, 16:30-18:00

I2-1. Smart Ports / Rm 215

Moderator: Tomoya Kawasaki, The University of Tokyo, Japan

I2-1-1

Full Paper

**A Survey on the State of Port Digitalization in the APEC Region:
A Structured Assessment Framework**

Lu Cheng, Richard van Liere, Manuel Martinez de Ubago Alvarez de Sotomayor,
Guo Shengton, Kai Xu

I2-1-2

Full Paper

**Energy Transition: The Role of the Italian Ports towards the Decarbonization of the
Shipping Sector. A Review**

Fabio Ballini, Giuditta Mikhail

I2-1-3

Full Paper

**AI Technologies' Costs and Benefits Framework within Port Industries:
Case Study Arrival Process to the Port of Antwerp**

Mehran Farzadmehr, Valentin Carlan, Thierry Vanelslander

I2-1-4

Full Paper

**Drivers of Collaborative Port Community System for Resilient Maritime Supply Chain:
A BWM-Fuzzy DEMATEL Approach**

Mohammed Mojahid Hossain Chowdhury, Wahidul Sheikh, Kazi Khaled Mahmud

I2-1-5

Full Paper

**Simulating Self-Organized Energy Efficient Dispatching of Automated Guided Vehicles
Employing Opportunity Charging**

Lawrence Henesey, Mihalis Golias

I2-1-6

Full Paper

Congestion Analysis of Container Terminal using Satellite Image and AIS Data

Kodai Yasuda, Ryuichi Shibasaki, Riku Yasuda

I2-1-7

Extended Abstract

Optimizing Container Relocation Operations by Using Deep Reinforcement Learning

Xuehao Feng, Rui Song, Kap Hwan Kim

Parallel Sessions

September 15, 16:30-18:00

K1-1. Digitalization / Rm 213

Moderator: Heesung Yun, Korea Maritime & Ocean University, Republic of Korea

K1-1-1 **Alternative Fuels and Shipowners' Strategies:
Will It be an Energy Revolution?**
Extended Abstract Ghiara Hilda, Palmesino Ennio, Tei Alessio

K1-1-2 **Barriers of Data Analytics for Energy Efficiency in the Maritime Industry**
Extended Abstract Veronica Jaramillo Jimenez, Ziaul Haque Munim, Hyungju Kim

K2-1. Green Shipping / Rm 213

Moderator: Heesung Yun, Korea Maritime & Ocean University, Republic of Korea

K2-1-1 **Stochastic Valuation of Alternative Fuels for Container Ship Investments**
Full Paper Hoejin Jeong, Heesung Yun

K2-1-2 **Green Finance in Bulk Shipping**
Full Paper Giorgia Morchio, Theo Notteboom, Giovanni Satta, Bianca Vottero

K2-1-3 **Vertical Integration and Decarbonization:
How Bundling Ocean Transport and Logistics can Reduce Green-House Gas Emissions**
Extended Abstract Michele Acciaro, Martin Jes Iversen

K3-1. AI, 5G and Other Technological Advances / Rm 213

Moderator: Heesung Yun, Korea Maritime & Ocean University, Republic of Korea

K3-1-1 **Measures to Control Maritime Cybersecurity Risks:
A Korean Perspective**
Full Paper Changki Park, Christos A. Kontovas, Zaili Yang, Chia-Hsun Chang

K3-1-2 **A Study on Market Forecast of International Logistics Using Natural Language
Processing -Based on a Questionnaire Survey for Major Freight Forwarders in Japan-**
Full Paper Daisuke Watanabe, Enna Hirata, Maria Lambrou

Parallel Sessions

September 15, 16:30-18:00

L1-3. Others / Rm 218

Moderator: George Vaggelas, University of the Aegean, Greece

- | | |
|------------------------------------|--|
| L1-3-1
Full Paper | Operation Reform of the Ocean Freight Forwarders between Pre and On- Covid-19 Pandemic Era
<u>Shiou-Yu Chen</u> , Hua-An Lu, Yi-Ning Huang |
| L1-3-2
Extended Abstract | Revisiting Disruptions and Resilience in Global Container Shipping and Ports: The Great Post-Covid Entanglement
<u>Theo Notteboom</u> , Thanos Pallis, Jean-Paul Rodrigue |
| L1-3-3
Extended Abstract | The State of Art of Human Rights Compliance in Supply Chains and Corporate due Diligence
<u>Enny Vöge</u> , Young-Tae Chang, Ah-Hyun Jo |
| L1-3-4
Extended Abstract | Geographic Diversification of ITOs: A Longitudinal Study to Understand the Internationalisation Patterns
<u>Giovanni Satta</u> , Francesco Parola, Francesco Vitellaro, Nicola Gianoni |
| L1-3-5
Extended Abstract | Decoding Logistics Trend in Japan using SNS Data
<u>Enna Hirata</u> , Takuma Matsuda |

September 16, 10:00-11:30

D4-1. Port Performance / Rm 216

Moderator: Athanasios Pallis, University of Piraeus, Greece

- | | |
|-----------------------------|---|
| D4-1-1
Full Paper | Analysis of Deterioration of Port Function and Long Offshore Waiting under Global Shipping Crisis
<u>Yasuhiro AKAKURA</u> |
| D4-1-2
Full Paper | Study on China's Ports Performance in Servicing B&R Based on the SBM-DEA Model and Time Window Analysis
<u>Lequn Zhu</u> , Ran Zhou, Xiaojun Li |

Parallel Sessions

September 16, 10:00-11:30

D4-1-3 **Financial and Economic Performance of Finnish Seaports
– Restructuring and Pandemic Impacts**
Extended Abstract
Pekka Leviäkangas, Shahid Hussain, Seong Mok Paik, Lauri Ojala

D4-1-4 **Does Bank Credit Quality Affect Port Productivity? Evidence from Spain and Ireland**
Extended Abstract
Andreas Tsakiridis, Eamonn O’Connor, Ingrid Mateo-Mantecón, Stephen Hynes,
Anastasios Matopoulos, Cathal O’Donoghue

E3-2. Energy and Fuels / Rm 217

Moderator: Sung Woo Ryoo, Youngsan University, Republic of Korea

E3-2-1 **Simulation-Based Estimation of Ammonia Bunkering Impacts on Bunker Supply Chain**
Full Paper
Mengyao YANG, Jasmine Siu Lee LAM

E3-2-2 **Alternative Energy Sources for Ships - Solar Energy - Technical Solutions, Advantages
and Disadvantages**
Full Paper
Sonia Maria Rudzińska

E3-2-3 **Green Hydrogen Hub:
Explorative Case Study of Puerto Brisa, Colombia**
Full Paper
Jonathan Gaviria Cicerí, Ximena Esperanza Rico Molano, Manuel Fernando Suárez Rivera

E3-2-4 **Low Carbon Transition in SME with Wind Assisted Ship Propulsion**
Extended Abstract
Lara Pomaska

E3-2-5 **A Study on Forecasting for Electronic Power Consumption of Busan New Port by Using
Deep Learning Model**
Extended Abstract
Seunghyun An, Geunsub Kim

E5-1. Green Ports / Rm 218

Moderator: David Adkins, University of Plymouth, United Kingdom

E5-1-1 **Global Guidance for Sustainable Development in Port-Cities**
Full Paper
Toby Roberts, Ian Williams, John Preston, Nick Clarke, Melinda Odum, Stefanie O’Gorman

Parallel Sessions

September 16, 10:00-11:30

E5-1-2

Full Paper

**Roadmap towards the Greening of European Seaports:
A Systematic Review**

Inès Lavadoux, Adriana Saraceni

E5-1-3

Full Paper

Incentive Strategies for the Promotion of Ship Shore Power

Yin Kou, Xinyi Zhu

E5-1-4

Extended Abstract

**Towards a Zero Emissions Port Stay:
The Role of Regulation, Fuel Prices, and the Key Challenges Faced by Stakeholders**

Thalis Zis

E5-1-5

Extended Abstract

**Sustainable Linear Hinterland Transport Infrastructure Development in Maritime
Logistics and the Impact on Local Communities:
The Case of Pipeline Transport**

Bruno Moeremans, Michäel Doods

E5-1-6

Extended Abstract

**Circular Economy Monitoring in Ports:
The Development of Circular Economy Indicators for Ports**

Lynn Faut, Fanny Soyeur, Elvira Haezendonck, Michaël Doods, Peter de Langen

H1-1. Freight Traffic Theory and Modelling / Rm 214

Moderator: Alessio Tei, University of Genoa, Italy

H1-1-1

Full Paper

**Dynamic Container Drayage Booking and Routing Decision Support Approach for
E-commerce Platforms**

Rui Chen, Shuai Jia, Qiang Meng

H1-1-2

Extended Abstract

Estimating Transport Mode Choice in International Trade

Onno Hoffmeister, Bernhard Dalheimer

H2-1. Intelligent Freight Transport Systems / Rm 214

Moderator: Alessio Tei, University of Genoa, Italy

H2-1-1

Extended Abstract

**Connecting ITS to Traffic Management for Sustainable Urban Freight Transport:
Lessons from Two Living Lab Pilots**

Abdel El Makhoulfi, Walther Ploos van Amstel

Parallel Sessions

September 16, 10:00-11:30

H2-1-2

Literature Review on Synchronodal Logistics

Extended Abstract

Gang Chen

I3-1. Smart Logistics / Rm 215

Moderator: Fabio Ballini, World Maritime University, Sweden

I3-1-1

An Immersive Visualisation for Cargo Unit Load Device Building-up Operations Optimisation

Full Paper

Eugene Y.C. Wong, Kev K. T. Ling

I3-1-2

Co-participation in Parcel Delivery Service in the Context of Online Purchasing: Perspectives from Resource Matching Theory and Value Co-creation Theory

Full Paper

Ching-Fu Chen, Chen-Ning Hsu

I3-1-3

Development Status and Effects of Smart Containers in Korea

Extended Abstract

DongSeop Han, ByungKwon Park, JaeJoong Kim, DongWan Kim, DoMyung Park, ByungHa Lee, HyungRim Choi

I3-1-4

Impact of Knowledge Acquisition and Ambidextrous Innovation and Innovation Performance of Logistics Enterprises

Full Paper

Lin Liu, Su-Han Woo, Ying Jin

I3-1-5

Analysis of Logistics Environment Efficiency and Productivity Changes in China

Full Paper

Jiang Huiying, Su-Han Woo

September 16, 12:00-13:30

D4-2. Port Performance / Rm 216

Moderator: Pekka Leviakangas, University of Oulu, Finland

D4-2-1

Efficiency Change in OBOR and Non-OBOR Ports under the Coronavirus Pandemic Shock

Full Paper

Xiyue Teng, Fulin Shang, Young-Tae Chang

Parallel Sessions

September 16, 12:00-13:30

D4-2-2

Full Paper

Energy Efficiency Analysis of Colombian Container Port Terminals

Luisa Fernanda Spaggiari Castro, Lara Pomaska, Gordon Wilmsmeier

D4-2-3

Extended Abstract

**Benchmarking Environmental Performance in National Port Systems
– Contributions to Climate Change Goals and Competitiveness**

Gordon Wilmsmeier, Luisa Fernanda Spaggiari Castro, Lara Pomaska, Mauricio Casanova,
Guillermo Heufemann, Nicolas Lozano

D5-1. Maritime Clusters / Rm 216

Moderator: Pekka Leviakangas, University of Oulu, Finland

D5-1-1

Full Paper

**Cross-Case Analysis of Singapore's Whole of Government Approach towards the
Development of Maritime Logistics Hub**

Daniel Seah, Wei Yim Yap

D5-1-2

Full Paper

**The Impact of Non-Profit Cluster-Based Organisations for Regional Competitiveness
and Growth:**

A Case Study Perspective

Cyril Dwarika, Jeraline Dwarika

E4-1. Environmental Innovation in Shipping, Ports and Terminals / Rm 217

Moderator: Christopher Dirzka, CBS, Denmark

E4-1-1

Full Paper

Predicting PM10 and PM2.5 Concentration in Container Ports:

A Deep Learning Approach

So-Young Park, Su-Han Woo

E4-1-2

Full Paper

Framework for Sustainability Assessment of Maritime Terminals

Ana Borda Zabala, Julia Pahl, Niels Gorm Malý Rytter

E4-1-3

Full Paper

Prediction of Harbour Vessel Emissions Based on Machine Learning Approach

Zhong Shuo Chen, Jasmine Siu Lee Lam, Zengqi Xiao

Parallel Sessions

September 16, 12:00-13:30

E4-1-4

Full Paper

A Feasibility Assessment of the Optimal Use of Hydrogen Drones in Fashion Item Replenishment Logistics

Eugene Y.C. Wong, Kev K. T. Ling, Chi-Wing Tsang

E4-1-5

Extended Abstract

**Advancing Innovation for Energy Transition:
EU Policy on Maritime Transport**

Michele Acciaro, Christopher Dirzka

E4-1-6

Extended Abstract

**Circular Economy Challenges for Gateway Ports:
The Case of the Port of Zeebrugge**

Fiona Maureen Courtens, Elvira Haezendonck, Michaël Doms

H3-1. Freight Modal Shift / Rm 214

Moderator: Alessio Tei, University of Genoa, Italy

H3-1-1

Full Paper

Impact of Northern Sea Route Expansion on Container Cargo Transportation and Trade between East Asia and Europe

Ruixuan Yu, Kazuhiko Ishiguro

H3-1-2

Extended Abstract

Evidence from the COVID Pandemic Shock on Global Freights

George Kokosalakis, Anna Merika, Henry Penikas

H3-1-3

Extended Abstract

**The “Port-Dry Port” Model between Generalization and Tailor-Made Solutions:
A Case Study of the Port of Genoa**

Claudia Caballini, Ghiara Hilda, Gommellini Giovanni

J2-1. The Belt and Road Initiative (BRI) / Rm 215

Moderator: David Gillen, University of British Columbia, Canada

J2-1-1

Full Paper

Quantifying the Impact of COVID-19 on Chinese Ports

Fulin Shang, Xiyue Teng, Minyoung Park

J2-1-2

Full Paper

**Connectivity and Geopolitics:
The Infrastructural Power of Shipping**

Federico Jensen

Parallel Sessions

September 16, 12:00-13:30

J3-1. Canals and Intermodal Corridors / Rm 215

Moderator: David Gillen, University of British Columbia, Canada

J3-1-1

Full Paper

Container Demand Estimation:

The China-Singapore International Land-Sea Trade Corridor

Siying Zhu, Mengtong Wang, Qiang Meng

J3-1-2

Extended Abstract

Expansion of the Panama Canal and Enlargement of Container Ships

Yong An Park, Seo Yeon Jeon

J4-1. Arctic Shipping / Rm 215

Moderator: David Gillen, University of British Columbia, Canada

J4-1-1

Full Paper

Impact of the Northern Sea Route by Using a Global Maritime Container Shipping Network Simulation (GMCS-NS) Model

Ryuichi Shibasaki, Chathumi Ayanthi Kavirathna, Sota Aoyagi, Keigo Shibuya, Naoki Kosuge