APEC Smart Port Development Forum

Theme: Develop Smart Ports to Promote Supply Chain Connectivity

20-21 October 2020 Qingdao, China

Host

APEC Port Services Network

中华人民共和国交通运输部
Ministry of Transport of the People's Republic of China

Co-host

Shandong Provincial Port Group

Session 1 Keynote Speeches: Development Trends of Smart Ports
Session 2 Smart Port Operation (Presentations)
Session 3 Panel Discussion: Development Modes and Issues of Smart Port

All APEC Member Economies are welcomed to join us!

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APEC PORT SERVICES NETWORK

APEC

APEC Port Services Network

THE APEC PORT SERVICES NETWORK AT A GLANCE

APEC Port Services Network (APSN) is a non-profit organization established on 18 May, 2008 in response to the directives of the 14th APEC Economic Leaders' Meeting held in 2006. Currently, 18 of 21 APEC member economies have joined APSN.

The APSN is a premier platform for communication and collaboration among port and port-related industries in the Asia-Pacific region. The APSN also creates a unique channel for dialogues between industries and competent authorities on various issues of common interests, by which the views of industries would be well presented.

the 14th APEC Economic Leaders' Meeting in November 2006

WHAT IS THE RELATIONSHIP BETWEEN APSN AND APEC?

Although APEC is the parent body of the APSN, the organization is independently run while maintaining regular communication with APEC. The APSN is responsible to the APEC TPT-WG to whom it reports on its work annually or more frequently if required.

WE FOCUS ON

Port and Supply Chain Connectivity

Port Safety and Security

Green and Sustainable Port

ADVISORY BOARD MEMBERS

Advisory Board Members are senior representatives from port and port-related industries of the APEC member economies, and the APSN Advisory Board represents a diverse range of the port and port-related sectors and includes small and large enterprises.

CORPORATE AND ASSOCIATE MEMBERS

Corporate and Associate Members are any interested groups or individuals from port and port-related industries in the APEC region.

18 COUNCIL MEMBERS

are senior representatives of the competent authority of each APEC member economy.

Canada

Hong Kong,China

Repulic of Korea

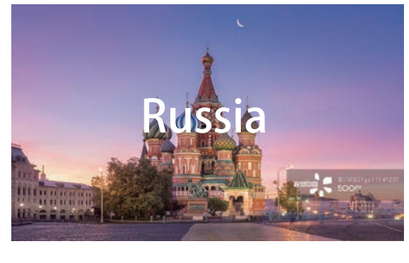
Papua New Guinea

The Philippines

Chinese Taipei

Viet Nam

New Zealand



APSN Forum on Digital Innovation and Port Connectivity

24 September 2019　Cuzco, Peru

Host　APEC Port Services Network

Co-host　PERÚ Ministerio de Transportes y Comunicaciones　Autoridad Portuaria Nacional

The APSN forum focus on digital innovation and port connectivity was held in Cusco, Peru on September 24, 2019. 120 participants from the relevant authorities, port and shipping companies and institutes attended the forum. Mrs. María Jara Risco, the Minister of Transport and Communications of Peru, and the Chairman of the Board of the National Port Authority of Peru delivered opening remarks at the opening ceremony. Mr. José Bustinza, Senior Official of Peru for APEC, delivered a keynote speech titled, "Connectivity and Digital Innovation in APEC's Vision Group."

Smart shipping technology is the "Golden Key" that will modernize the traditional shipping industry

Mr. Zhang Baochen, Chairman of the Academic Committee at China Waterborne Transport Research Institute, delivered a keynote speech, titled "Trends Towards Digitalized Ports and Smart Shipping." Mr. Zhang summarized the five main elements of smart shipping system as follows: smart vessel, smart port, smart navigation support system, smart shipping service, and smart shipping supervision. He argues that smart shipping technology is the "golden key" that will help the traditional shipping industry solve future problems. Intelligent shipping technology will help the traditional shipping industry to get rid of its heavy reliance on human resources, promote safe and green shipping, improve shipping efficiency, and reduce shipping cost.

The port equipment should be developed in a digital, networked and intelligent way. A fully automated system can help collect data and receive feedback in real-time. The big data technology and intelligent expert diagnosis technology can be used for early warnings of machinery failure and intelligent maintenance of port equipment. Mr. Zhang shared several cases applied to commercial intelligent shipping: intelligent control system of container terminal gate, unmanned straddle carrier, the world's first unmanned port truck, 5G smart heavy truck, management and control platform based on the Internet of Things for port collection and distribution, online port energy management system, collection system according to the bill of lading number system for container port, remote safety monitoring and diagnostic system, and structure health and safety supervision system.

The Growth of the global middle class market and Supply Chain 4.0

Mr. Biju Ninan Oommen, Senior Ports & Maritime Transport Specialist at The World Bank, delivered a speech on "Digital Innovation Trends in Supply Chains." The global middle-class market is growing slowly in advanced economies and growing rapidly among emerging market economies.

The middle-class market in the U.S., Europe, and Japan is projected to grow at only 0.5% per year, compared with annual growth of 6% or more in China and India. Currently, there are 33 megacities on the Earth, with another six on the way by 2030. By 2022, there will be 2.8 billion internet users and 28.5 billion networked devices and connections. The top 10 countries ranked by retail e-commerce sales are China, U.S., UK, Korea, Germany, France, Canada, India, and Russia. The concept of Technologies of Supply Chain 4.0 is about IoT, Big data analytics, 3D printing, advanced (autonomous) robotics, smart sensors, augmented reality, blockchain, artificial intelligence, cloud computing, etc. Data and analytics are important to decision making. At present data analysis is being used in 50% of the decision-making in transportation and logistics, which will grow to 90% within the next five years. The next-generational port of Singapore includes unmanned aerial vehicle, autonomous ship, E-navigation, maritime sense-making system, next-generation vessel traffic management system, green and community-oriented port, automated terminal, just-in-time planning and coordination system, maritime single window, automated quay cranes, automated yard cranes, and automated guided vehicles.

Which is important to their e-commerce customers—Fast Shipping or Cheap Shipping?

Dr. Sung Woo Lee, Deputy President of Port & Logistics Research Division at Korea Maritime Institute, delivered a speech titled "Global Supply Chain Trend——Transportation Mode Changes in the E-commerce Market by KMI." In his remarks, he pointed out that the growth of e-commerce is far outpacing the growth of overall retail sales and will reach $4 trillion by 2020 with e-commerce sales projected to increase from 10%(2017) to nearly 15%(2020) of total retail sales worldwide. Despite strong growth in the US e-commerce market, China's share is nearly double that of the US. China is the biggest e-commerce country with high growth. Cross-border e-commerce is expected to expand at a 25% annual growth rate in the coming 5 years. More than 60% of all cross-border e-commerce shipments are inter-continental. The preference for shopping on a smartphone has increased from 14% in 2016 to 29% in 2018. Consumer surveys from 41 countries around the world claim that one fifth (20%) of respondents shopped online once a week on average. Amazon, Alibaba/AliExpress, eBay and Wish account for 64% of cross-border e-commerce.

As for the customers of E-commerce, which is more important to them—fast shipping or cheap shipping? Survey results indicate that they want both. 84% of cross-border goods bought online are under 2kg and half of the goods bought weighed only 500g. On product weight, air express average shipment size has dropped by 20% due to the impact of increased e-commerce shipments since 2010. On product category, the top 5 delivery commodities are clothing, electronics, health & beauty, jewelry & watches, books, and media. Regarding shipping mode, 80% of cross-border B2C shipments are sent via air, but cross-border B2C sea shipments mode will increase in the future.

How should we manage delivery time? Consumers expect low shipping fees, so e-commerce sellers must do everything they can to minimize order fulfillment costs. Meanwhile, for online retailers, the average cost to fulfill an order is 70% of the average order value. Consumers want to receive goods quickly, but without increased costs. How should suppliers manage the last mile of e-commerce delivery? Merchants can apply new technologies such as the algorithms and analytics currently used by companies like Uber & Google to connect couriers with merchants. In the next 2-5 years, new technologies will continue to emerge, such as drones and automatic delivery vehicles. The application of large data and AI arithmetic technology makes cross-border freight cheaper and faster. Automated ports centered on hardware such as robots and UAVs and digital ports centered on software such as AI, big data, Internet of Things, and block chain technology are changing the container port industry. The rising labor costs and technologies progress promote the construction of automated container terminals. Container terminals should build operation centers to speed up the transport of goods. One new trend is to add e-commerce-related operation centers to port supply chain management.

Putting digital innovation into practice in global ports

Mr. Javier Lancha De Micheo, CEO at APM Terminals Callao, delivered a presentation titled "Basics and Technology." Global container ports are working together to develop unified standards for the DCSA. IBM is developing its E-commerce system for ports. Canadian ports have developed a port truck reservation management system. Amsterdam is developing big data single-window platform. Lisbon is using block chain technology to develop its online service platform, and China's port industry is also developing block chain related service technology modules. In order to achieve timely arrival and sustainable development of port services, it is necessary to conduct studies on macro-level strategic policies of customer demand, labor-intensive industries, compliance, and other factors. Leaders need to understand the current situation of industry and technology, and follow the problem-oriented thinking to resolve relevant issues.

Cyber attack- the great threat of the 4th digital revolution

Mr. Roger Bernedo Boado from Perú delivered a speech titled "Growing threats of the 4th Digital Revolution." He began his presentation with an alarming infographic showing the shocking scale of cyber-attacks on businesses. Nearly all of the famous companies and organizations around the world have been attacked by hackers including but not limited to the FBI, Facebook, NASA, SONY, etc. The latest variety of cyber-attacks on terminals include malware, ransomware, and crypto-jacking. Network threats include cyber hijackers, cyber killers, cyber pirates, cyber terrorism and cyber. Regarding data security, the "dark web" has been increasing its services with significant independence and attacking social networks to extract personal information and steal personal identities. Thus, it is necessary to be prepared in the following aspects: create a culture on information security, include drastic sanctions on working regulations, get ISO 27001, 20000 and 31000 certifications, establish emergency protocols in case of cyberattacks, hire ethical hackers' services, determine the security gap, and invest in security tools and security services.

Mr. Lee Jek Suen, Vice President of Strategic Planning at Jurong Port, gave a presentation on "Jurong Port's Journey towards Business Innovation and Digital Transformation," where he posted the question , "what is a Next Generation Multipurpose Port (NAMPP)?" He stressed that NAMPP ports are smart & efficient, digital & business-friendly, and safe, secure & sustainable ports. Jurong Port has improved business integration through digitalization and connected to the external trade and logistics IT ecosystem. Their enterprise data hub will enable real-time monitoring and trend analysis. The keys to smart & connected NGMPP are standards and policies, interoperability, and digital collaboration platforms.

Smart & Connected Nest-Generational

Digital transformation for future port

Ken Chan, CEO of COSCO SHIPPING Ports Chancay Peru, delivered a speech on "Digital Transformation in Future Ports." Digital transformation is not simply the application of new technolgies, but rather, it is the fundamental transformation of port operations, management, and even business model driven by a new generation of information technology. Digital transformation is, essentially, an industrial revolution which consists of three levels as follows: Level one—Equipment/Operation automation/digitalization; Level two—Digitalization of the port community (e.g. Small ports in Abu Dhabi, Khalifa Port Project and Xiamen Ocean gate 5G pilot program); Level three—Digitalization of the whole port ecosystem. In Abu Dhabi, Khalifa Port Project includes fully automated yards, the innovative single cantilever automated RMG, intelligent gate system, quay cranes with remote control capacity, and yard trucks with capacity for future driverless operation. In China, Xiamen Ocean gate 5G pilot program includes intelligent planning, driverless driving, crossing, smart tally, central control supervision platform, and remote control platform.

Jessie Chung, Chairman of Hong Kong Container Terminal Operators Association, delivered a speech on "Digitalization in a Hong Kong Port." Digitalization in Kwai Tsing Container Port (HK) includes electronic release orders, remote-controlled rubber-tyred gantry cranes, various operations systems and application of blockchain. Kwai Tsing Container Port also has the world's first remote-controlled RTGC automated stacking system. Each crane is equipped with 58 monitoring cameras and integrated into a database to work out where and how the containers can be grounded and stacked. The working environment of crane operators has also improved by switching to indoors crane cabinet. The efficiency and productivity has improved more than 20% compared to the previous manual mode. The Hong Kong government has also developed the Trade Single Window system to provide a one-stop electronic platform for import and export trade documents. In 2019, the Guangdong government also adopted the Trade Single Window platforms to create a synergy effect between Hong Kong and Guangdong.

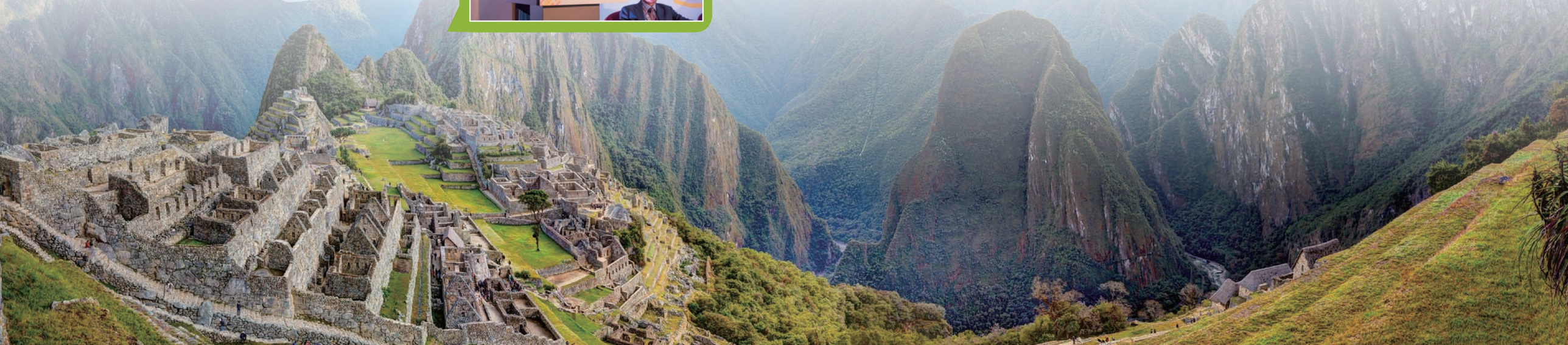
Synergy effect is developed between the Single Trade Window platforms in Guangdong and Hong Kong.

Some innovations in the Qingdao automated container terminal

Mr. Li Bo, the Operation Manager of Qingdao Port Automated Terminal, gave a presentation on "China's Practice of Scientific and Technological Innovation in Qingdao Port's Fully Automated Container Terminal." Qingdao port has initiated AGV automatic cycle charging technology which is the world's lightest of its kind with unlimited endurance. The port also has initiated a "Pinning with One Click" system, which ensures that all equipment can be automatically anchored within 2 minutes. Other technological innovation includes the unequal length backreach double trolley STS and the first automatic container twist locking robot, which are all the first initiatives of its kind.

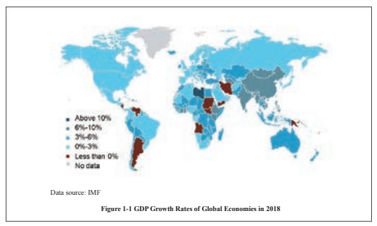
Capt. Jaime Barandiaran Laca Crew Manager, Safety Coordinator of DPA, CSO & PFSO IMO Professional Maritime Casualty Investigator Ership Grupo——Spain, Peru, delivered a speech on "E.U. Blue Growth, Port of Vigo Project," subtitled "Port digitalization, competitiveness, efficiency, and sustainability." He presented a report on the EU's Blue Economy, which indicates a wide range of interlinked, established and emerging sectors. In all, 75% of Europe's external trade & 37% of trade within the EU is seaborne, the sea and the coasts are drivers of the economy. The blue growth plan issued by the European Union in 2012 proposes to incorporate the concepts of intelligence, sustainable development and inclusive growth into the European 2020 plan. Moreover, the European Commission set up a long-term strategy to support sustainable growth in the marine and maritime sectors as a whole. Captain Barandiaran Laca ended his speech with an example of how these Blue Growth object are being implanted at Port Vigo in Spain, which aims to become an interconnected, innovate, green and inclusive port.

EU blue economy and blue growth Vigo



Asia-Pacific Port Development Report

This report focuses on the development of Asia-Pacific ports, covering trade, ocean shipping, Port infrastructure and operation, laws and regulations, intelligent and sustainable development. With its detailed statistics, and in-depth analyses, Asia-Pacific Port Development Report has become an important reference for those engaging in port-related industries.



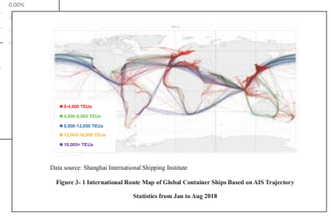
Data source: IMF

Figure 1-1 GDP Growth Rates of Global Economies in 2018

Note: * indicates projections.

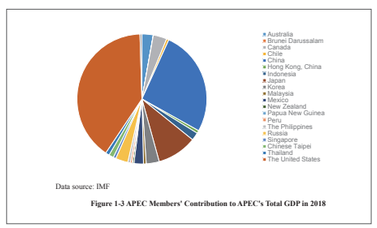
Data source: Clarksons

Figure 2-1 Global Container Shipping Volumes in 2000-2018



Data source: Shanghai International Shipping Institute

Figure 3- 1 International Route Map of Global Container Ships Based on AIS Trajectory Statistics from Jan to Aug 2018

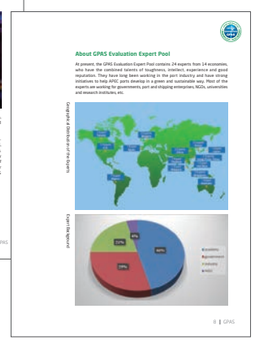


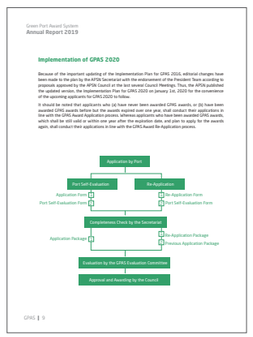
Data source: IMF

Figure 1-3 APEC Members' Contribution to APEC's Total GDP in 2018

Green Port Award System Annual Report

This report shares the recent development of Green Port Award System (GPAS). Developed by the APSN, GPAS is a green evaluation system for ports in the APEC region. It represents an integral part of our ongoing efforts to promote the green growth of the APEC port industry as a whole.





GPAS 2020 calling for application by June 30!

Green Port Award System (GPAS)

All ports in the APEC community are welcome to join GPAS!

What is GPAS?

The GPAS program is a green evaluation system for ports in the APEC region, and it represents an integral part of APEC TPT-WG's ongoing efforts to promote the green growth of the port industry. Since the official launch of GPAS in 2016, 27 ports or related entities from 9 APEC economies have won the title of APEC Port Services Network Green Port.

Objectives:

GPAS is expected to better improve the environmental awareness, promote the sustainable development green strategy, advance the green interoperability and share the best practices for ports in Asia-Pacific region. Joining the GPAS program will significantly lift the profiles of ports and induce huge impacts on society.

GPAS Award Winners of 2019:

- Laem Chabang Port, Port Authority of Thailand, Thailand
- Lianyungang XSG - IMC Port Co., Ltd., China
- Port of Taichung, Taichung Brach of TIPC, Chinese Taipei
- QQCTN, Qingdao Port of Shandong Port Group, China
- Sapangar Bay Container Port, Sabah Ports, Malaysia
- Terminal Internacional del Sur S.A, Peru
- Terminal Portuario PERU LNG Melchorita, Peru

For more program information and application processes, please visit the APSN website:

www.apecpsn.org

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MILESTONE
OF THE APSN

2008

Beijing,China
The APSN Office was setup in Beijing, China.

2009

Shenzhen, China
The APSN Conference on Port Development

Tianjin, China
The APSN Training Workshop on Port Facility Security

2010

Shanghai, China
The APSN Workshop on Free Trade Zones at Ports

2011

San Francisco, USA
The APSN Workshop on Green Ports

2012

Hong Kong, China
The APSN Workshop on Green Shipping and Supply Chains

2013

Phuket, Thailand
The APSN Workshop on Green Ports: Time for Action and Innovation

2014

Seattle, USA
APSN Workshop on Gateway Ports and Supply Chain Connectivity

2015

Cebu City, the Philippines
APSN Workshop on Improving Port and Supply Chain Connectivity

2016

Penang, Malaysia
APSN Workshop on Safety of Dangerous Goods at Ports

2017

Ho Chi Minh City, Viet Nam
APSN Workshop on Restructuring of Shipping and Port Industry:
Trends and Challenges

2018

Singapore
Port Connectivity Forum & APSN 10th Anniversary Celebration

2019

Cuzco, Peru
APSN Forum on Digital Innovation and Port Connectivity

2020

Qingdao, China
APEC Smart Port Development Forum