



# Strategies to Improve Port-related Business

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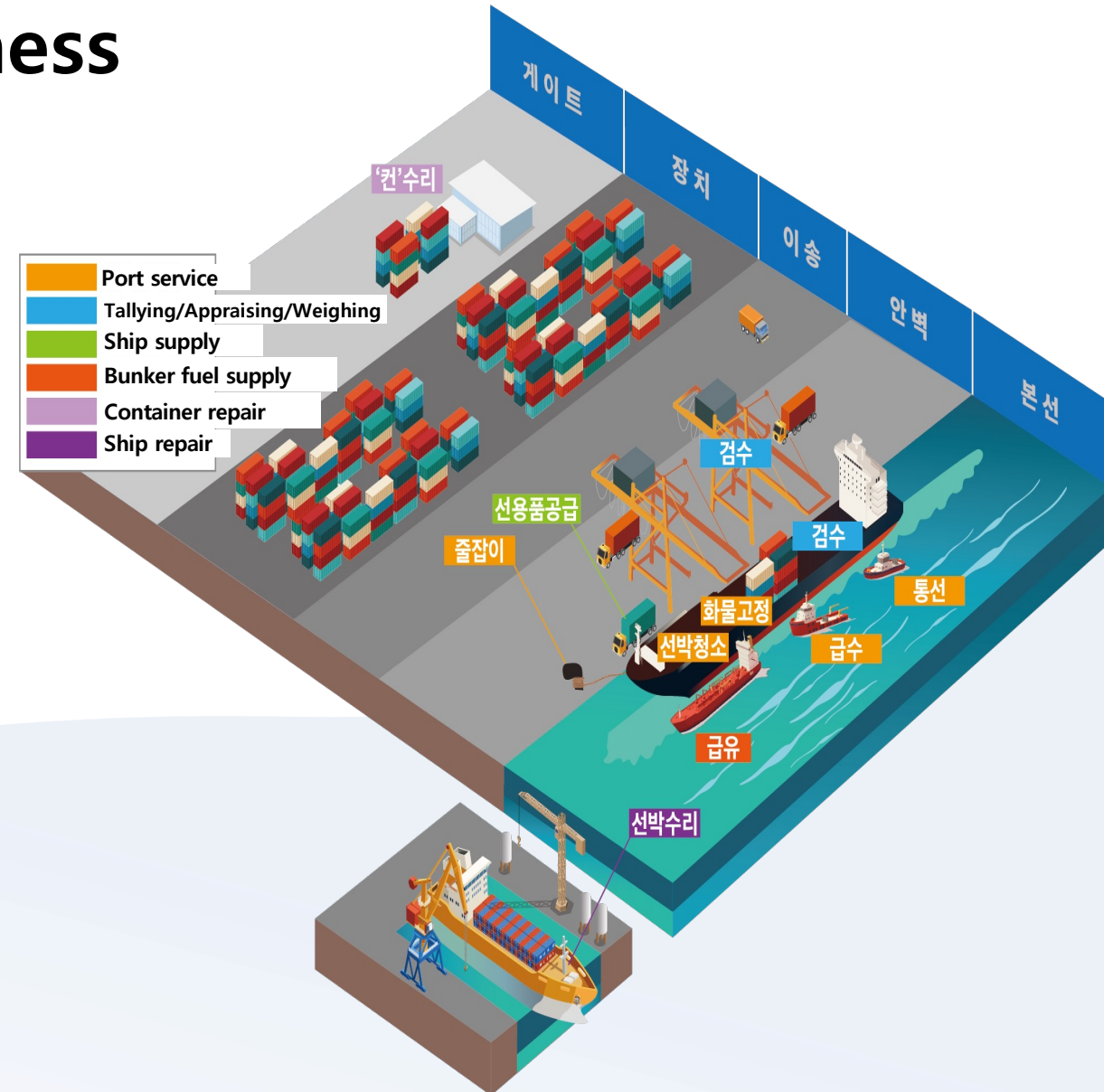
# Definition of port-related business

- Port-related business as defined in the “Harbour Transport Business Act”

[ Scope of the port-related business ]

Grouping	Business	Definition
Port transport business	Port loading and unloading	A business that handles entire distribution process, including loading and unloading cargo onto ships at ports, storage, equipment, and transportation
	Tallying	When loading or unloading freight shipped, calculating the number of freight thereof or certifying delivery or taking over the freight
	Appraising	Certifying, investigating and appraising (hereinafter referred to as “appraisal”) in connection with freight shipped and a ship (including a barge)
	Weighing	When loading or unloading freight shipped, calculating or certifying measurement or weight of the freight
Port transport-related business	Port service	A. Transporting persons or documents between the carrying vessel and the harbor using a plying boat B. Guarding the carrying vessel and providing a tugboat service to assist in the berthing and unberthing of the carrying vessel C. Such activities as cleaning ships (excluding the cleaning of oil tanks); removing sewage; disinfecting ships; collecting and transporting waste; securing cargo; and painting ships D. Supplying clean water for ships
	Ship supply	Business of supplying beverage, foods, consumables, ropes, spare parts, and accessories for repairing, furniture, and other similar chandleries
	Bunker fuel supply	Business of supplying fuels for ships
	Ship repair	Business of repairing, replacing, or painting ship facilities and equipment, such as the hull of a ship and engines
	Container Repair	Business of repairing containers

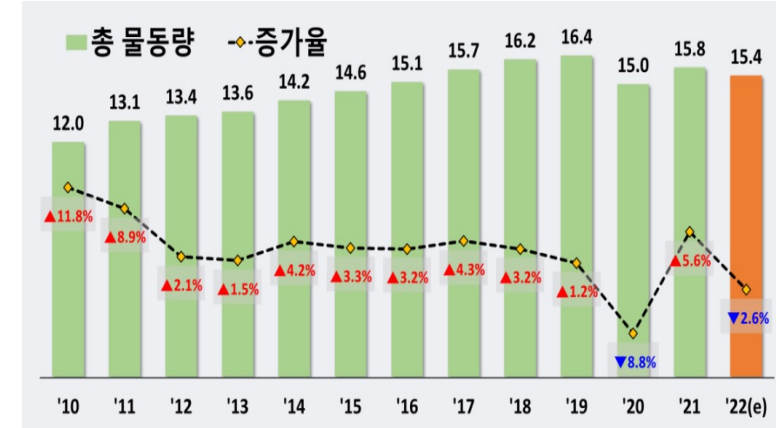
- Port-related businesses provide services for stevedoring and ship operations in port.
- In areas where port-related businesses are concentrated, such as Busan, it is an industry that has a significant impact on the local economy, as it is closely linked to front and back-end industries such as shipping, ship management and shipbuilding.



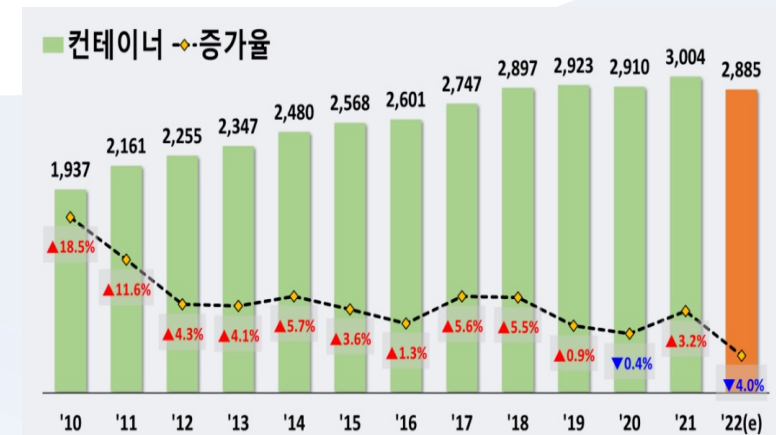
## Observed changes in port-related business

- Slower port volume growth
  - ✓ Domestic port volumes have grown from about 1.2 billion tons in 2010 to 1.55 billion tons in 2022, but the actual growth rate is slowing down.
- Facilitate ship upsizing
  - ✓ As ships become larger, the average tonnage per berth is increasing, but the number of berths at a decrease.
- Increased importance of port services
  - ✓ Port services are becoming increasingly important due to the growing influence of shipping companies.

[ Port volume growth (billion tons, %) ]



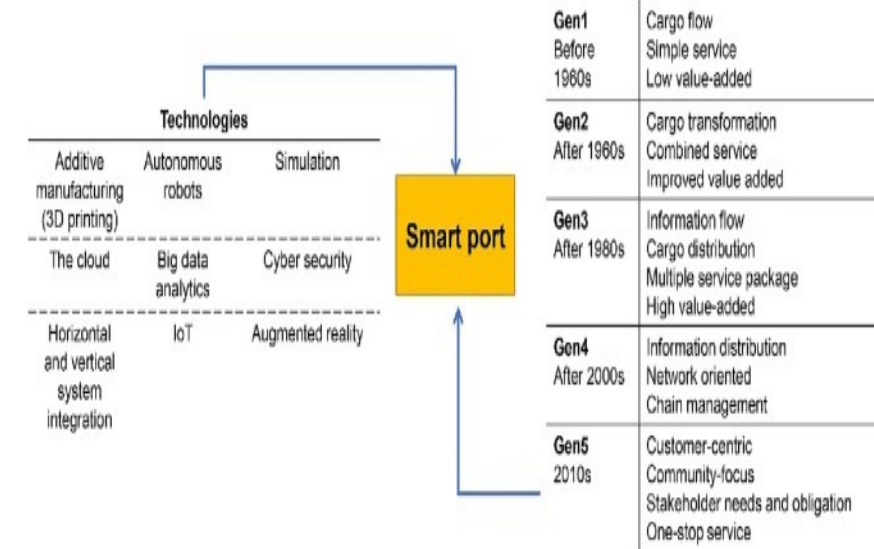
[ Container volume growth (TEUs, %) ]



# Observed changes in port-related business

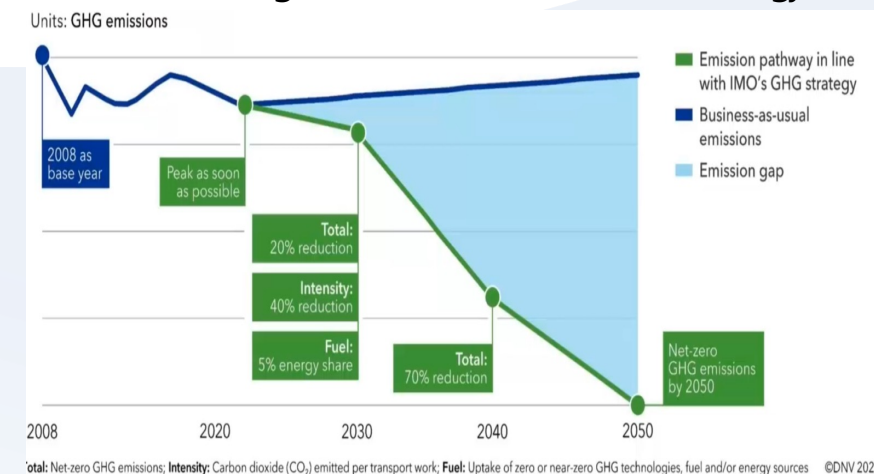
- Encouraging smartization of ports and changing employment structures
  - ✓ Promoting the application of Industry 4.0 technologies in the port industry will drive automation and digitalization
  - ✓ Changes in the port workforce due to smartization will also affect how port-related businesses work and their workforce structure.
  
- Increasing demand for eco-friendliness in shipping and ports
  - ✓ Issues of carbon neutrality are driving greening of ports and changes in marine fuel.

[ Application and development stage of new technology in port ]



Source: Kevin X. Li et al.

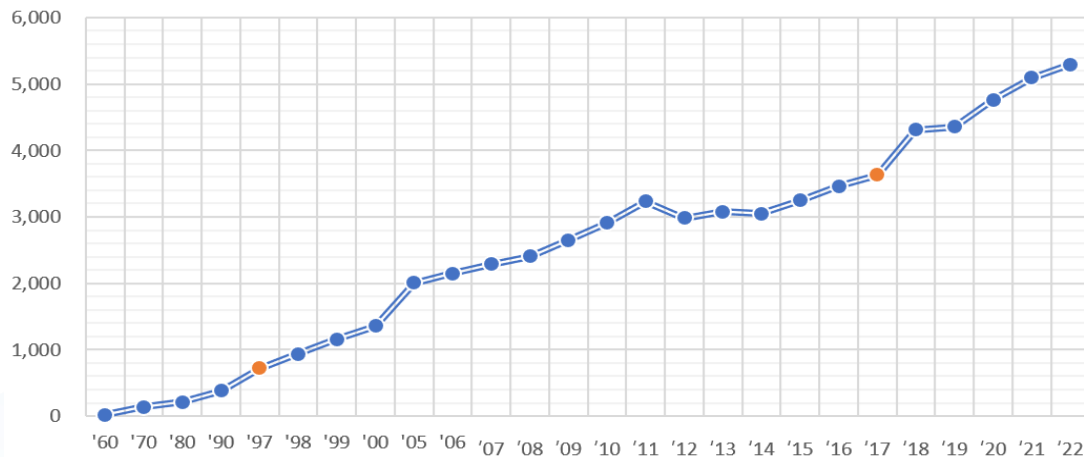
[ Reduction targets under the IMO 2050 GHG strategy ]



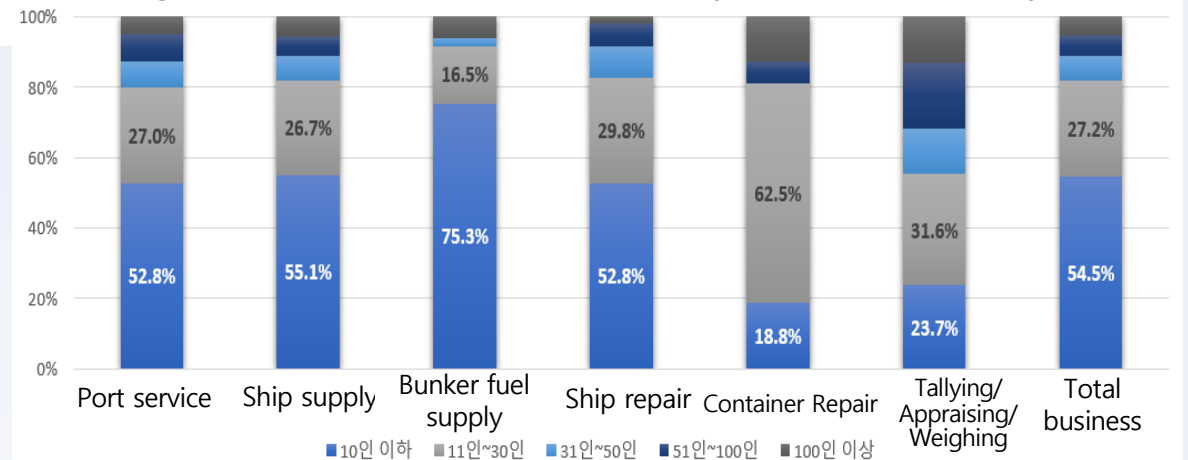
# Port-related business management

- Number of enterprises in port-related business
  - ✓ Since the transition to the reporting system for port-related enterprises in 1997, the number of enterprises has continued to increase.
- Number of employees in port-related business
  - ✓ All businesses are dominated by enterprises with 30 or fewer employees; especially port services, ship supply, bunker fuel supply and ship repair are witnessed where the majority of enterprises have 10 or fewer employees.

[ Changes in the number of port-related business (number of enterprises) ]



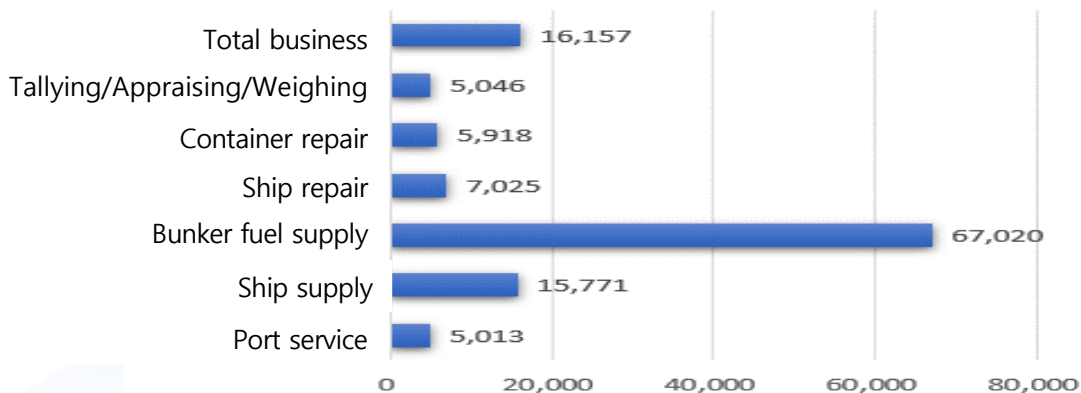
[ Percentage of enterprises in port-related business by size of persons employed (%) ]



# Port-related business management

- Key business indicators of port-related businesses are deteriorating
  - ✓ Based on the analysis of business performance of port-related business enterprises in five major regions from 2019 to 2021, the average revenue per enterprise is estimated to be about KRW 16.2 billion, and the average operating profit is about KRW 800 million.
  - ✓ According to the analysis of business performance, growth, profitability, and stability of port-related business by industry during the same period showed an overall deterioration trend: growth and profitability particularly tended to shrink in most enterprises.

[ Average sales by in port-related business (KRW million) ]



[ Changes in management performance of port-related business ]

	Port service	Ship supply	Bunker fuel supply	Ship repair	Container Repair	Tallying/ Appraising/ Weighing
Growth	▼	▼	▲	▼	▼	▲
Profitability	▼	▼	-	▼	▼	▲
Safety	-	▲	▼	▲	▼	▲



# Measuring service satisfaction in port-related business

- Conducting a user survey to measure service satisfaction in the domestic port-related business
  - ✓ Based on the five basic attributes of the SERVQUAL model, the survey developed eight questions on four attributes, including ① tangibles, ② reliability, ③ responsiveness, and ④ assurance according to the service characteristics of the port-related business.

[ Service Satisfaction Measurement Scale for Port Related Industries ]

Attributes	Measurement scales	Details
Tangibles	Facilities and equipment	The company has good facilities and equipment.
	Manage services	The company has a well-established network of cooperation between stakeholders (port authorities, operators, etc) and a good customer service system.
Reliability	On-time and accurate	The services they provide are delivered on time and free of errors.
	Consistency	Service levels, pricing, staff attitudes, etc. are always consistent.
Responsiveness	Flexibility	Flexibility to adapt to customer needs, including when and how services are delivered.
	Fast and efficient	Deliver services quickly and efficiently without unnecessary work.
Assurance	Safe Workplace	The company itself maintains a safe work environment when providing the service.
	Incident handling	No accidents or problems with ports, ships, etc, when providing services, and good response capabilities when they do occur.



# Measuring service satisfaction in port-related business

- As a result, it was found that 'assurance' and 'reliability' were relatively low among service attributes

[ Results of service quality measurement in port-related business ]

Attributes	Measurement scales	Port service	Ship supply	Bunker fuel supply	Tallying/ Appraising/ Weighing	Ship repair	Container Repair	Overall Average
Tangibles	Facilities and equipment	0.63	0.45	0.58	0.50	0.64	0.64	0.57
	Manage services	0.48	0.61	0.54	0.36	0.61	0.26	0.48
	Average	0.56	0.53	0.56	0.43	0.63	0.45	0.53
Reliability	On-time and accurate	1.03	0.57	0.84	0.69	0.74	0.42	0.72
	Consistency	0.88	0.67	0.89	0.69	0.64	0.43	0.70
	Average	0.96	0.62	0.87	0.69	0.69	0.43	0.71
Responsiveness	Flexibility	0.56	0.65	0.86	0.43	0.51	0.52	0.59
	Fast and efficient	0.56	0.71	0.67	0.57	0.72	0.64	0.65
	Average	0.56	0.68	0.77	0.50	0.62	0.58	0.62
Assurance	Safe Workplace	0.81	0.88	0.85	0.59	0.87	0.53	0.76
	Incident handling	0.90	0.93	0.95	0.71	0.94	0.63	0.84
	Average	0.86	0.91	0.90	0.65	0.91	0.58	0.80
Overall Average		0.73	0.68	0.77	0.57	0.71	0.51	0.66

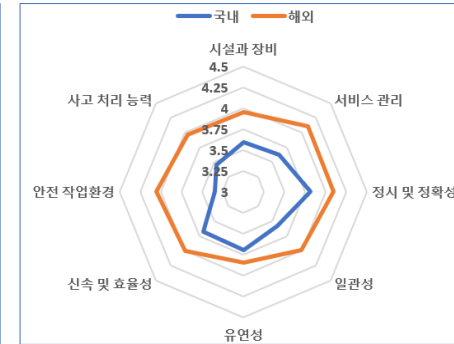
# Measuring service satisfaction in port-related business

- Service satisfaction of domestic port-related business is lower than that of overseas advanced ports
- ✓ Port services, ship supply, ship fuel supply, and inspection, appraisal, and measurement industries were found to be satisfactory with the service of overseas ports. In contrast, ship and container repair industries showed little difference in satisfaction between domestic and overseas ports.
- ✓ Across all six port-related business verticals, the overseas port with the highest level of service satisfaction was Port of Singapore and Port of Rotterdam. They were also cited as the ports with the highest level of service satisfaction across the majority of verticals.

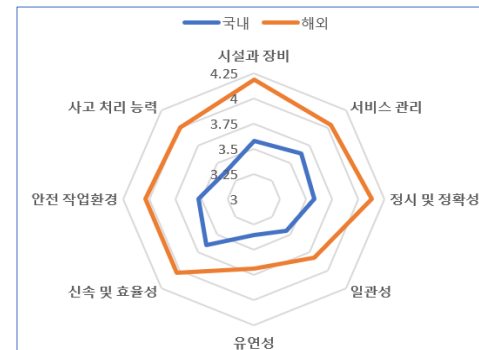
[ Port service ]



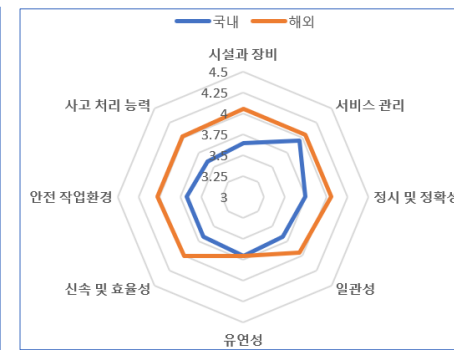
[ Ship supply ]



[ Bunker fuel supply ]



[ Tallying/Appraising/Weighing ]



[ Ship repair ]



[ Container repair ]



# Measuring service satisfaction in port-related business

[ Linking service quality attributes to key issues in port-related business ]

Service satisfaction attributes	Problems in port-related business						
	Commonalities	Ship supply	Container repair	Ship repair	Port service	Tallying/Appraising /Weighing	Bunker fuel supply
Tangibles	<ul style="list-style-type: none"> <li>•Lack of acceptance of high-tech and environmental facilities, etc.</li> </ul>	<ul style="list-style-type: none"> <li>•Complex distribution structures</li> <li>•Lack of procurement and management expertise</li> </ul>	<ul style="list-style-type: none"> <li>•Difficulty securing a repair site (paying rent in the terminal)</li> </ul>	<ul style="list-style-type: none"> <li>•Lack of facilities to repair large ships</li> </ul>	<ul style="list-style-type: none"> <li>•Aging plying boat and water supplying boat, Small size boat only</li> </ul>		<ul style="list-style-type: none"> <li>•Lack of ship modernization</li> <li>•Complex distribution structures</li> </ul>
Reliability	<ul style="list-style-type: none"> <li>•Small business fragmentation reduces reliability</li> <li>•Lack of specialized talent</li> <li>•Lack of cost consistency</li> <li>•Lack of statistical foundation</li> </ul>	<ul style="list-style-type: none"> <li>•Vulnerabilities in international networks</li> <li>•Lack of Goods Statistics</li> <li>•Lack of international certification</li> </ul>	<ul style="list-style-type: none"> <li>•Low repair rates</li> </ul>	<ul style="list-style-type: none"> <li>•The aging workforce and foreign worker acquisition challenges</li> </ul>		<ul style="list-style-type: none"> <li>•High qualification level</li> <li>•Low published rates, Failure to honor published rates in contracts</li> </ul>	<ul style="list-style-type: none"> <li>•Delayed dissemination</li> <li>•Fuel oil quality distrust</li> <li>•Distrust of metered refueling</li> </ul>
Responsiveness	<ul style="list-style-type: none"> <li>•Aging workforce and staffing challenges</li> </ul>		<ul style="list-style-type: none"> <li>•Increased workload due to safe harbor implementation</li> </ul>	<ul style="list-style-type: none"> <li>•Higher repair costs than competitors due to high wage structure</li> </ul>			
Assurance	<ul style="list-style-type: none"> <li>•Safety incidents due to aging facilities</li> </ul>		<ul style="list-style-type: none"> <li>•Safety Incidents</li> </ul>	<ul style="list-style-type: none"> <li>•Perceived as a polluting industry, causing complaints</li> </ul>	<ul style="list-style-type: none"> <li>•Safety Incidents</li> </ul>		

# Overseas examples in port-related business

- Port service
  - ✓ Optimize port calls to improve on-time and productivity of port services.
  - ✓ Smartizing port facilities and equipment.
- Ship supply
  - ✓ Operate a comprehensive online ship supply solution (Shipserv).
  - ✓ Industry-Favorable Customs Administrative Procedures.
- Bunker fuel supply
  - ✓ Improve trust with rigorous supplier management and supply standards.
  - ✓ Establish an LNG hub by acquiring bunkering facilities and vessels.

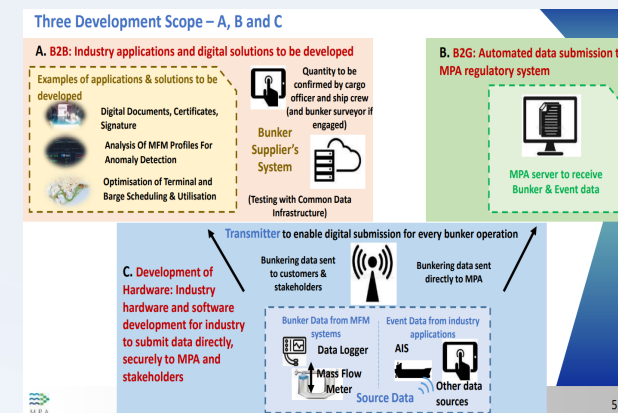
[ Port of Rotterdam's Smart Bollard ]



[ Japan's Smart Mooring System ]



[ Digital bunkering of Singapore ]





# Overseas examples in port-related business

- Ship repair
  - ✓ Have a large dock to handle variety of vessel types.
  - ✓ Use underwater robots to improve productivity and safety.
- Container repair
  - ✓ Create a large repair yard outside the terminal to increase scale, create an indoor work environment, and improve equipment rates and congestion inside the terminal.
- Tallying/Appraising/Weighing
  - ✓ Introduce an intelligent CCTV-based automated inspection system.

[ Port of Baltimore's container repair yard ]



[ Gwangyang Port's container repair yard ]



[ Ship repair work using robots ]





# How to improve port-related business

- There is a need for strategies to respond to future environmental changes and to improve the quality of service and business environment for port-related businesses to increase competitiveness.
- The Ministry of Oceans and Fisheries (MOF) is also working to improve the system to solve problems and to support port-related business.
  - ✓ The amendment to the “Harbour Transport Business Act”, which will take effect in December 2023, includes a legal provision that allows the government and local governments to provide support to port-related business.
- Enhancing port-related business not only improves the competitiveness of ports and adds value, but also promotes the growth of national and regional economies.

# How to improve port-related business

[ Improvement measures for port-related business ]

Direction	Purpose	Commonalities	Ship supply	Container Repair	Ship Repair	Port Service	Tallying/Appraising/Weighing	Bunker fuel supply
Improve service quality	Tangibles and assurance			•Building a large-scale co-use container repair center (④)	•Create a Large Repair Complex (⑤) •Adopting advanced technologies (⑥)	•Introduction of smart technologies such as smart mooring systems (⑧) •Strengthening information connections(⑨)		•Ship Modernization (⑬)
	Reliability and responsiveness	•Enhancing professional training (⑯) •'Good Business Certification' Program (⑰) •Establishing a statistical base through a survey (⑳) •Building a comprehensive service platform (㉑)	•Enable digital platforms (①)		•Expanding foreign employment policies (⑦)	•Introduction of drone transportation(⑩)	•Relaxed entry requirements and creating a flexible workplace (⑪)	•Ensure quality with mass flow meters, digital bunkering (⑭)
Improve management environment	Management safety	•Strengthen corporate guarantee and financial support systems (⑱)						
	Growth and profitability	•Enhancing digital support (⑲) •Establishing market order and combating illegal behavior (㉒)	•Improving the tariff system (②) •Expand overseas expansion and enhance cross-industry marketing				•Appropriate rate increases and notices (⑫)	•Expanding marine fuel energy sources to open new markets (⑮)





**Thank you!**

