

Twin Engines of Sustainability : Digitalization and Decarbonization at Busan Port

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Busan Port Authority(BPA)

BPA, a state-owned company under the Ministry of Oceans and Fisheries launched in January 2004 for the development, operation and management of Busan Port



Government Control

Port Authority Act



Corporate Management

Prerequisite for BPA



Operation and Development of
Busan Port



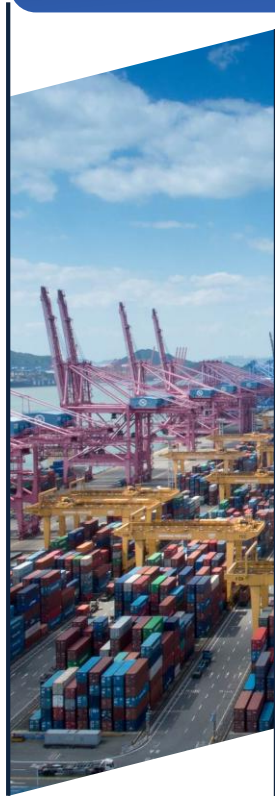
Autonomy
(Budget and Human Resource)



Port Commissioner
(Board of Director)



BPA Business Area



1
Port
Operation



2
Port
Development



3
Port
Redevelopment



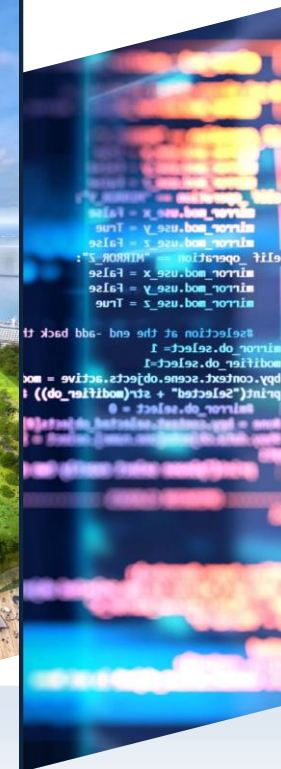
4
Logistics
Distripark
Development



5
Overseas
Business

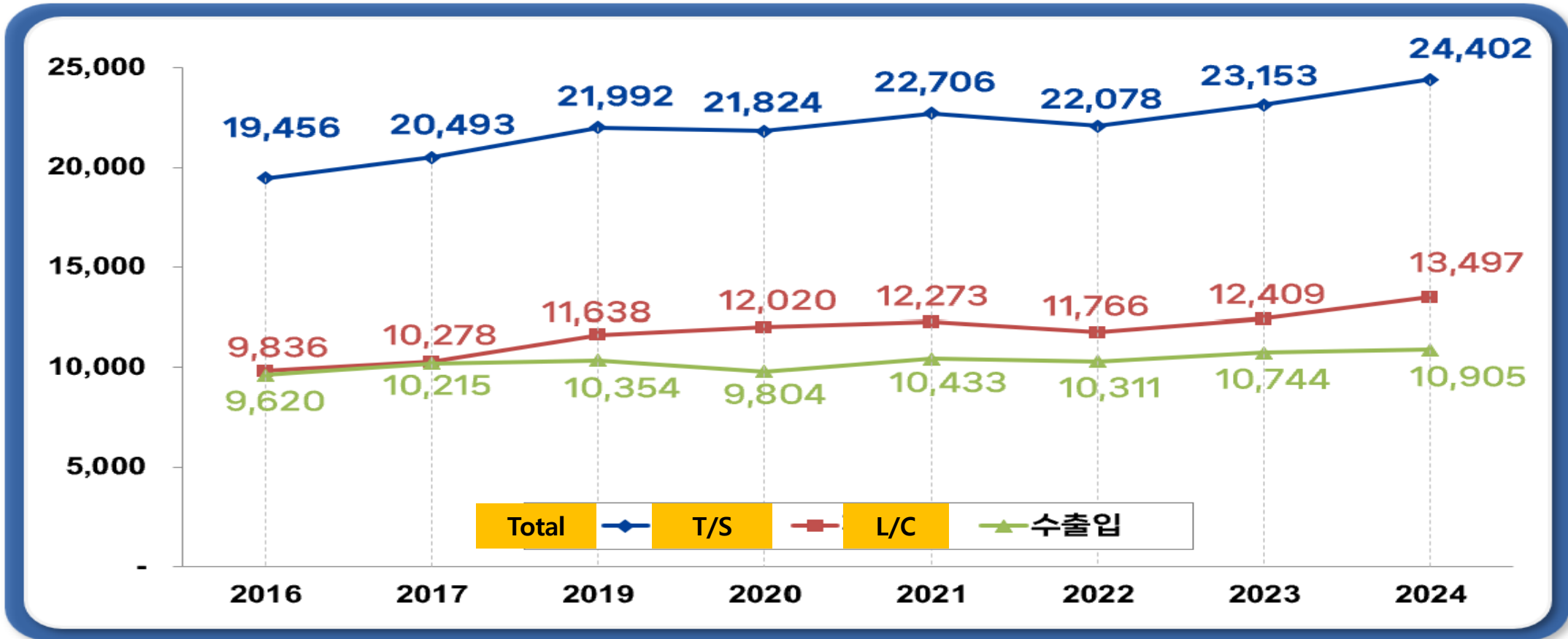


6
Eco-friendly
Port



7
Digitalization

Busan Port Throughput in recent 8 years



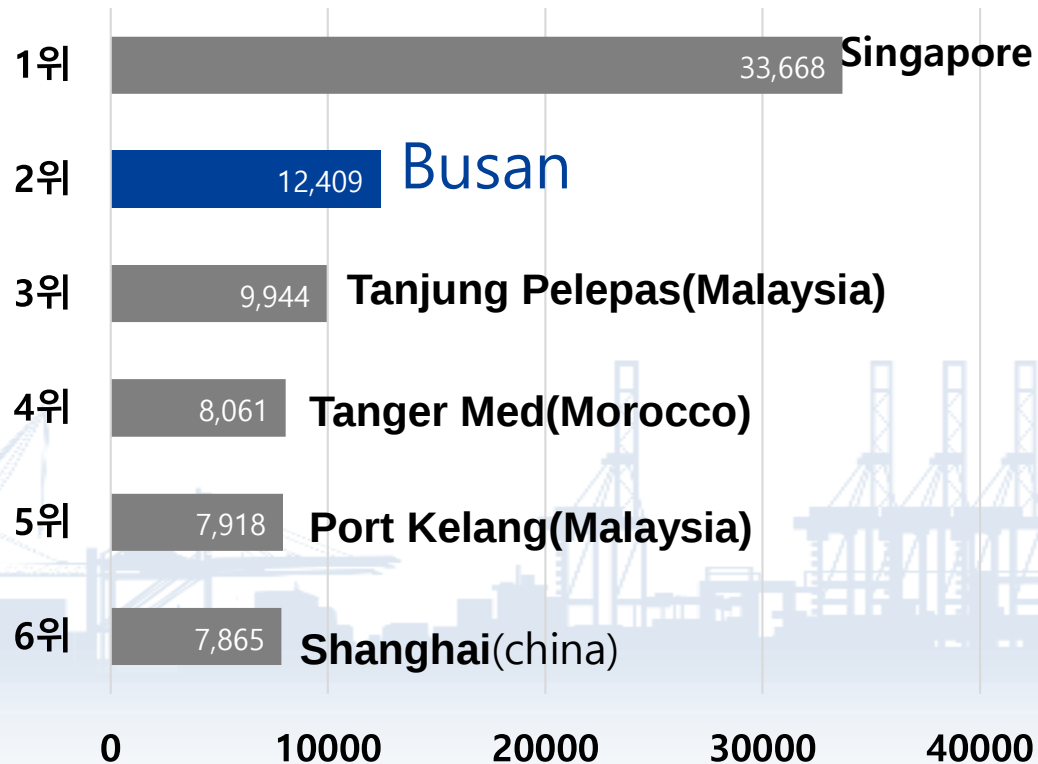
* In 2024, cargo volume at Busan Port increased by 5.4% compared to the previous year (transshipment up 8.8%, exports and imports up 1.5%), recovering after the decline in 2022

Current Status of Busan Port

➤ The 2nd busiest T/S Port and 7th busiest Port in the world * Container throughput

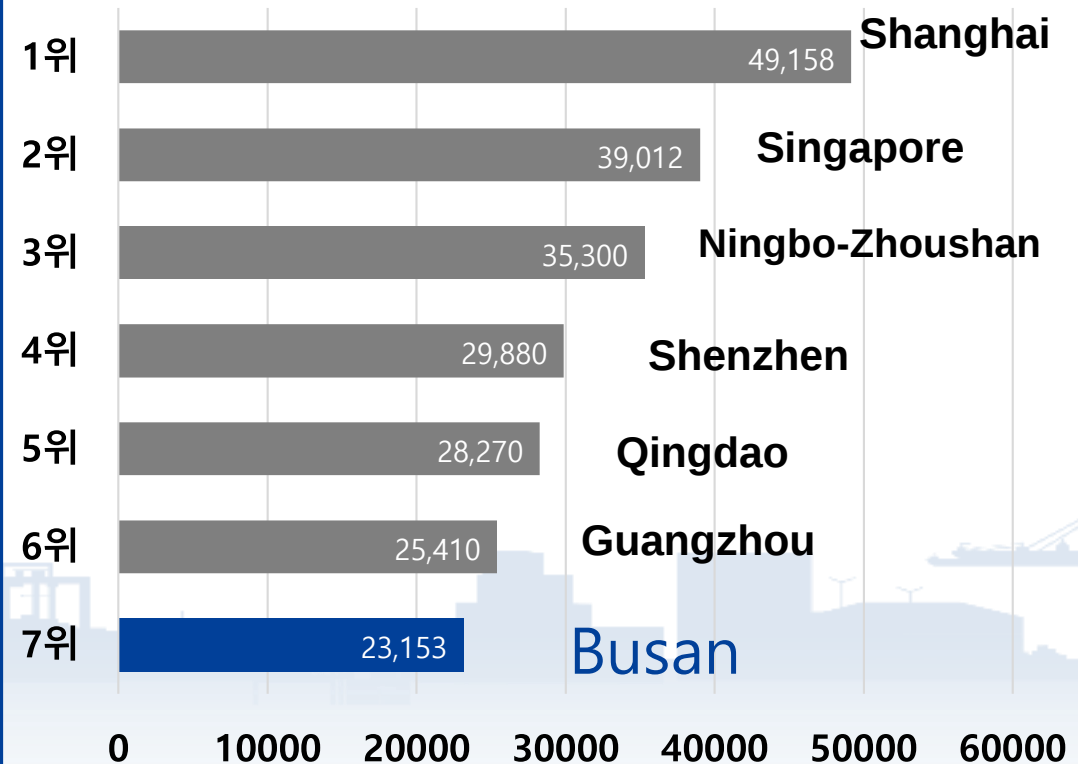
World's Top 6 T/S Ports

Ranking('23) (unit : 1,000TEU)

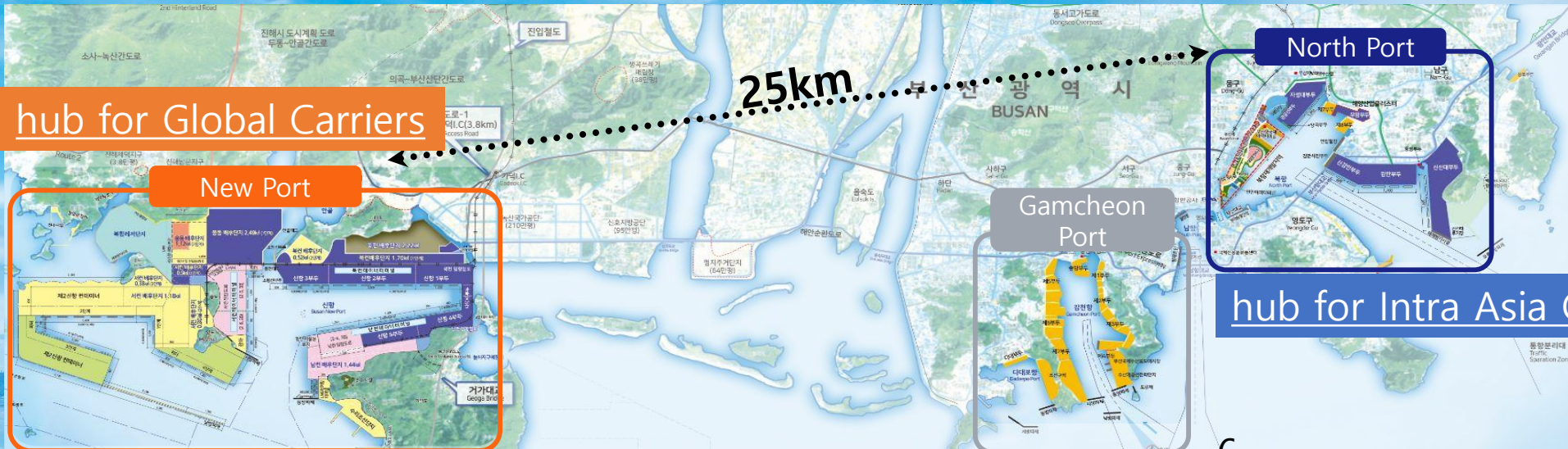


World's Top 7 CNTR Ports

Ranking('23) (unit : 1,000TEU)



Busan Port Overview



Two engines of Sustainability at Busan Port



**Decarbonization : Green energy,
zero-emission operations**



**Digitalization : Smart, connected,
and automated port systems**

**Drive Busan Port towards
a GREENER and SMARTER future**

Busan Port 2050 Net-Zero Master Plan

VISION Eco-friendly Busan Port leading global carbon neutrality through new opportunities

Achieving 2050 Net-Zero and Realizing a Sustainable Busan Port

GOAL

Greenhouse Gas Emissions(tCO₂eq)
(2018) 247,258 → (2050) 0

Energy Self-sufficiency Rate
(2018) RE 0 → (2050) RE 100

DIRECTIONS

Building a Low-carbon Port

Transition to Energy Self-sufficient Port

Advancement of Environmental Management Systems

TASKS



1-1 Strengthening the foundation of carbon management

1-2 Leading greenhouse gas reduction within the port

1-3 Establishing carbon-neutral infrastructure

2-1 Expanding renewable energy supply

2-2 Smart energy operation and management

2-3 Promoting hydrogen utilization

3-1 Expanding the scope of environmental management systems

3-2 Strengthening carbon management capacity

3-3 Sharing environmental knowledge

Net-zero practices at Busan Port

Onshore Power Supply



Electric powered vessel



Conversion of YT fuel (Diesel->LNG)



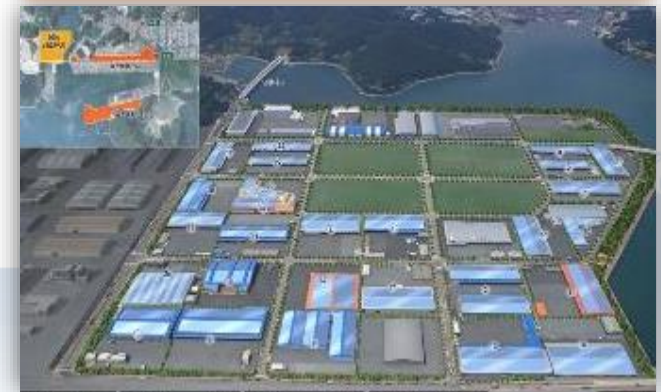
Diesel Particulate Filter



e-RTGC systems



Rooftop photovoltaic panels



Port Community System(PCS)

Port Community System = No Operational Delays

- Carrier
- TML Operator
- Port Authority
- Customs
- Shipper
- Forwarder
- Trucking Company
- Rail Operator
- Quarantine
- Logistics Company

Cargo Visibility ↑

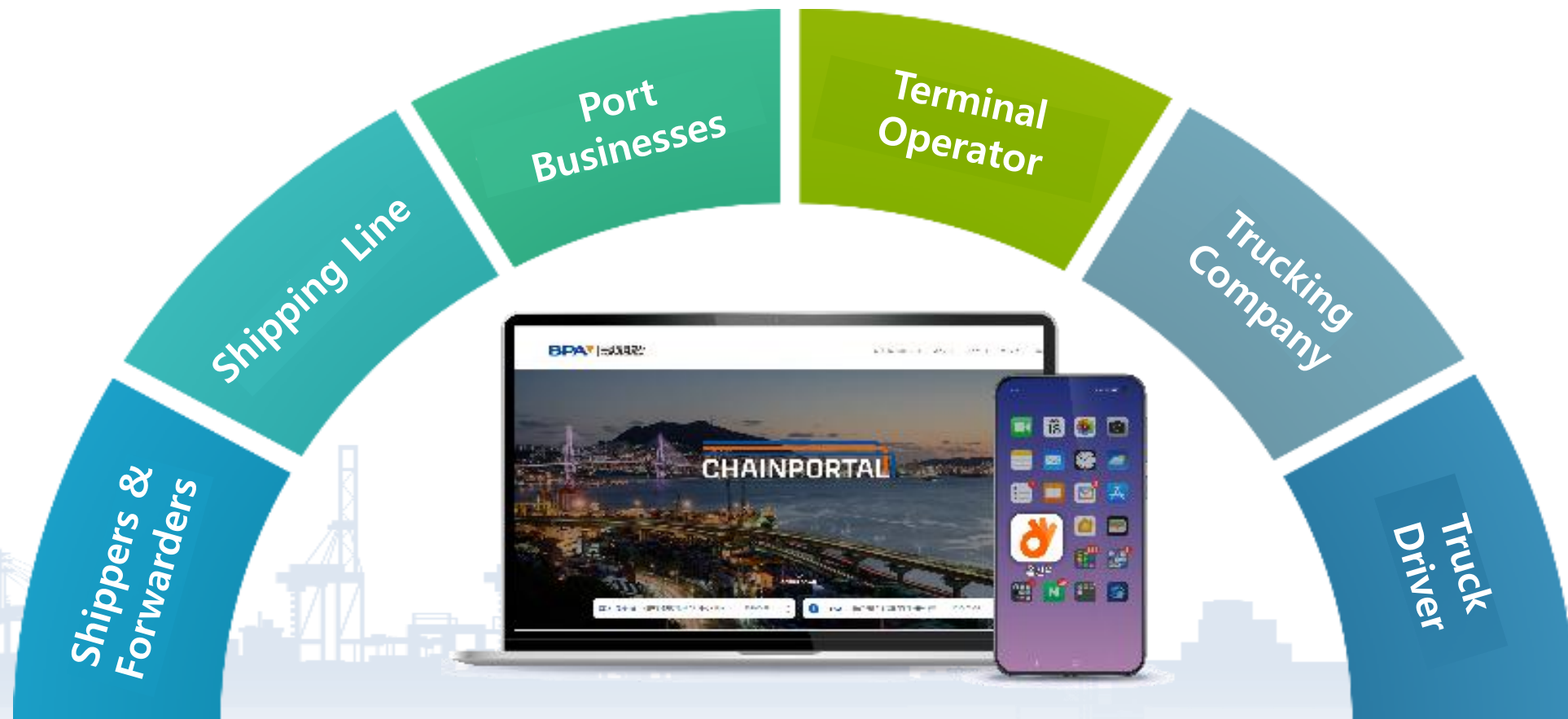
<World Bank>

- Singapore
- Rotterdam
- Busan

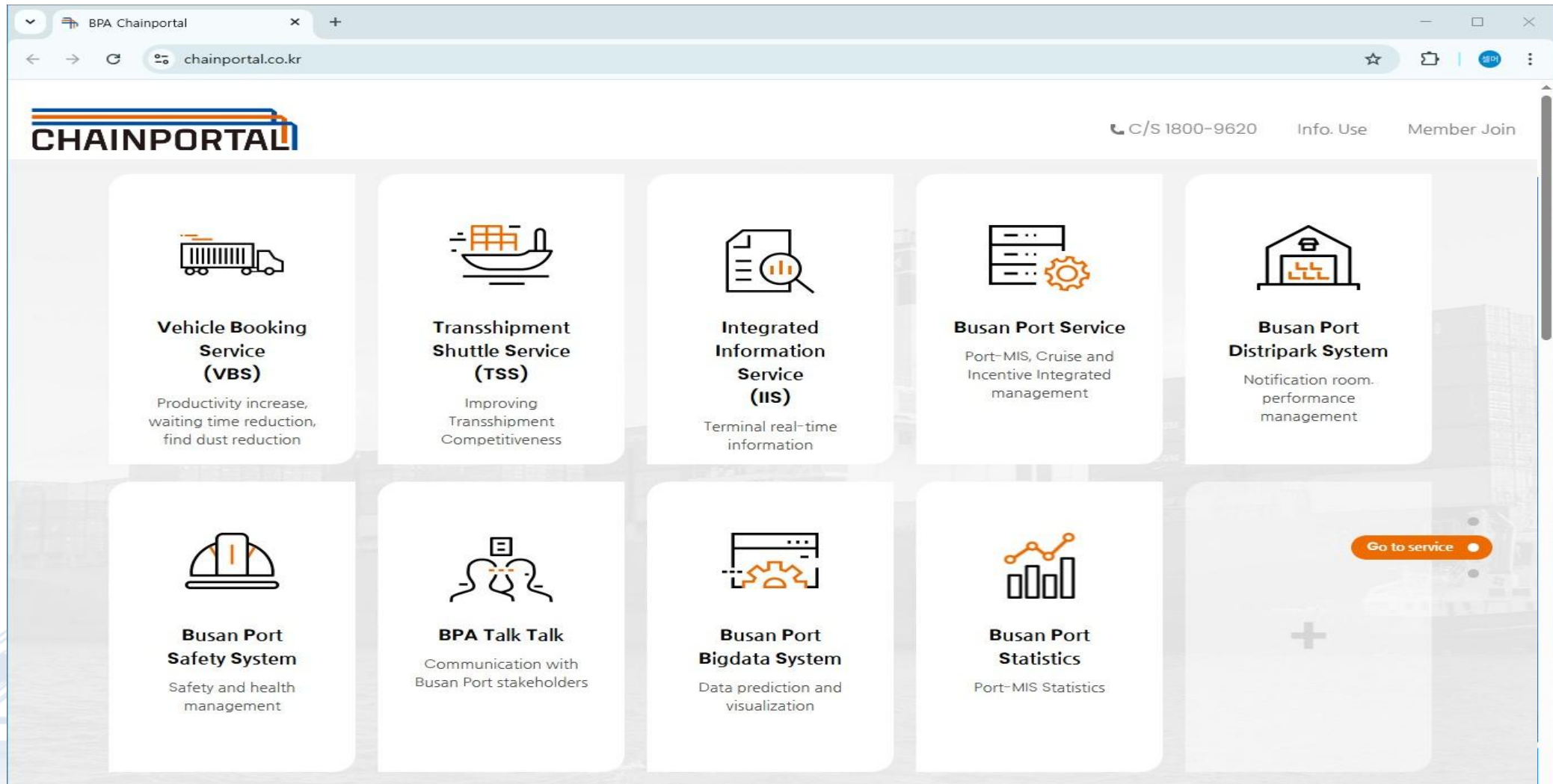


Chain Portal – Integrated Port Logistics Information Platform

Block Chain Based Real-Time Information and
Data Sharing Platform for Port Stakeholders



Busan Port PCS(Chain Portal)



e-Equipment Interchange Receipt

① Identify risks

Truck Drivers

Frequent get offs are inevitable in terminals



A truck driver walking along right next to large heavy machineries

Port Personnel

Hard to communicate with the truck driver



Giving hand signs to the truck driver during container cleaning process

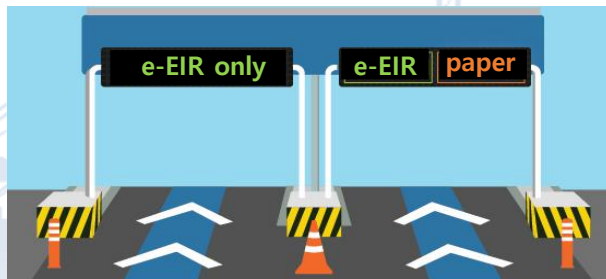


② Coming up with solutions

- Establishing a **no-disembarkation process** for truckers
- Developing **real-time communication channel** between port personnel and truck drivers
- Proactive dissemination of urgent alerts** to notify potential safety hazards within terminal premises

③ Decide adoption

Hardware

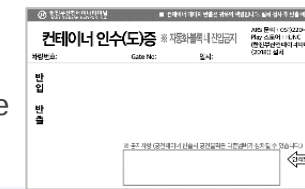


Installing dedicated e-EIR gates to facilitate efficient and secure entry and exit procedures



Developing an integrated e-EIR application to enhance overall port logistics

Software



paper EIR

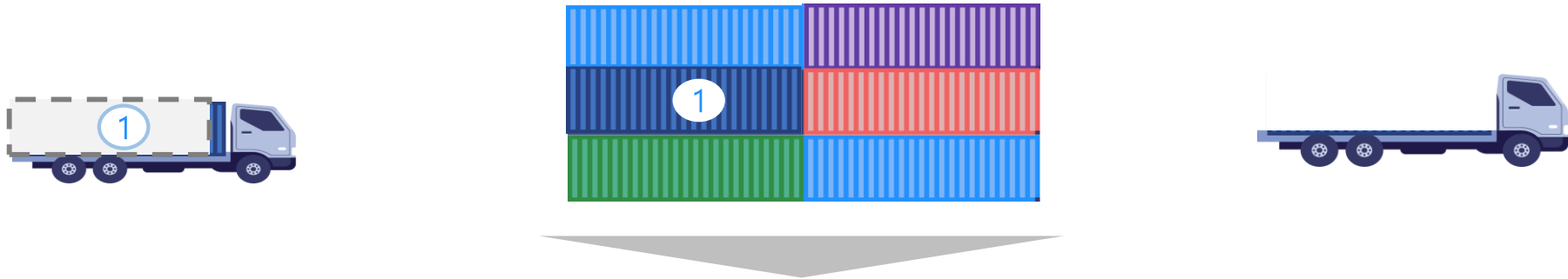


e-EIR

Transshipment Support System(TSS)

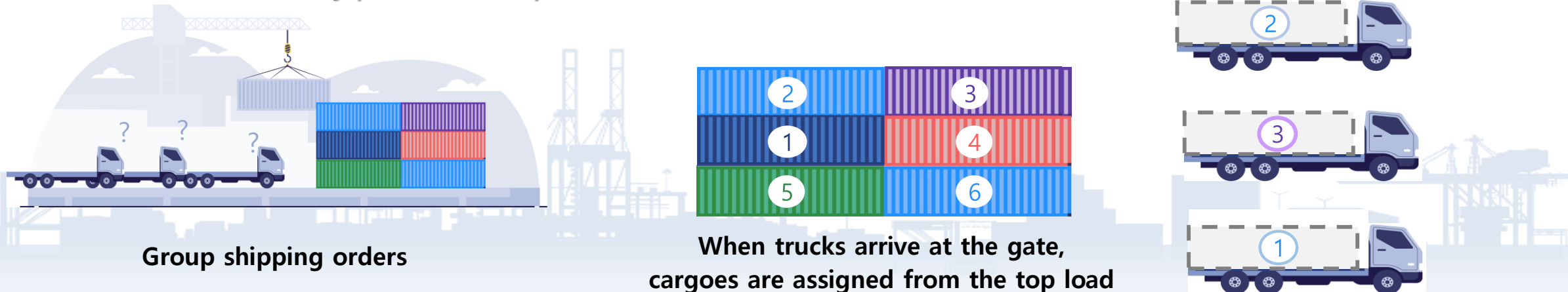
[Before] Single shipping order: Mapping one truck for one cargo

→ Inefficiency and increased waiting time due to the location of cargoes



[Now] Group shipping order : Multiple trucks and cargoes are mapped for group order

→ Orders are automatically placed in the optimal order



Busan Port-i

Transshipment Data Integration

Strengthening Data Security

Enhancing Transshipment Competitiveness

01 Real-time Integration of Terminal Data

02 Utilization of Blockchain Technology

03 Development of Transshipment Monitoring system(Port-i)

Data Sharing with Stakeholders

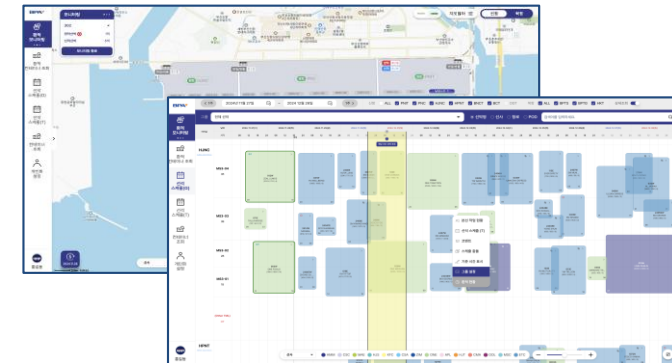


- 10 Terminals at Busan Port
- Data sharing among shipping companies, terminals, etc.

Block Chain Platform(BaaS)



- Ensuring information integrity
- Guaranteeing the reliability of information



- Transshipment operations via a single platform
- Enhancing Transshipment efficiency

Fully Automated Terminal(New Port Pier 7)



BPA Overseas Investment Projects



Category	Rotterdam Logistics Center	Barcelona Logistics Center	Indonesia Logistics Center	LA/LB Logistics Center
Partners	Port of Rotterdam Authority Samsung SDS	Barcelona Port Authority Korean Logistics Company French Logistics Company	KIND Indonesian Shipping Company	Korean Freight Forwarder
Project Detail	Operation of logistics center	Operation of logistics center	Operation of Bonded W/H and Stevedoring	Operation of logistics center
BPA's Role	W/H Construction & Operation	W/H Operation by Sub-lease	W/H Construction & Operation, Stevedoring	Operation of logistics center

THANK YOU



Sep. 23rd, 2025