BUSAN International Port Conference 2025

BPA 부산항만공사 BUSAN PORT AUTHORITY

Twin Engines of Sustainability : Digitalization and Decarbonization at Busan Port

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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

GOAL

Achieving 2050 Net-Zero and Realizing a Sustainable Busan Port

- 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	2-1 Expanding renewable energy supply	3-1 Expanding the scope of environmental management systems
1-2 Leading greenhouse gas reduction within the port	2-2 Smart energy operation and management	3-2 Strengthening carbon management capacity
1-3 Establishing carbon-neutral infrastructure	2-3 Promoting hydrogen utilization	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

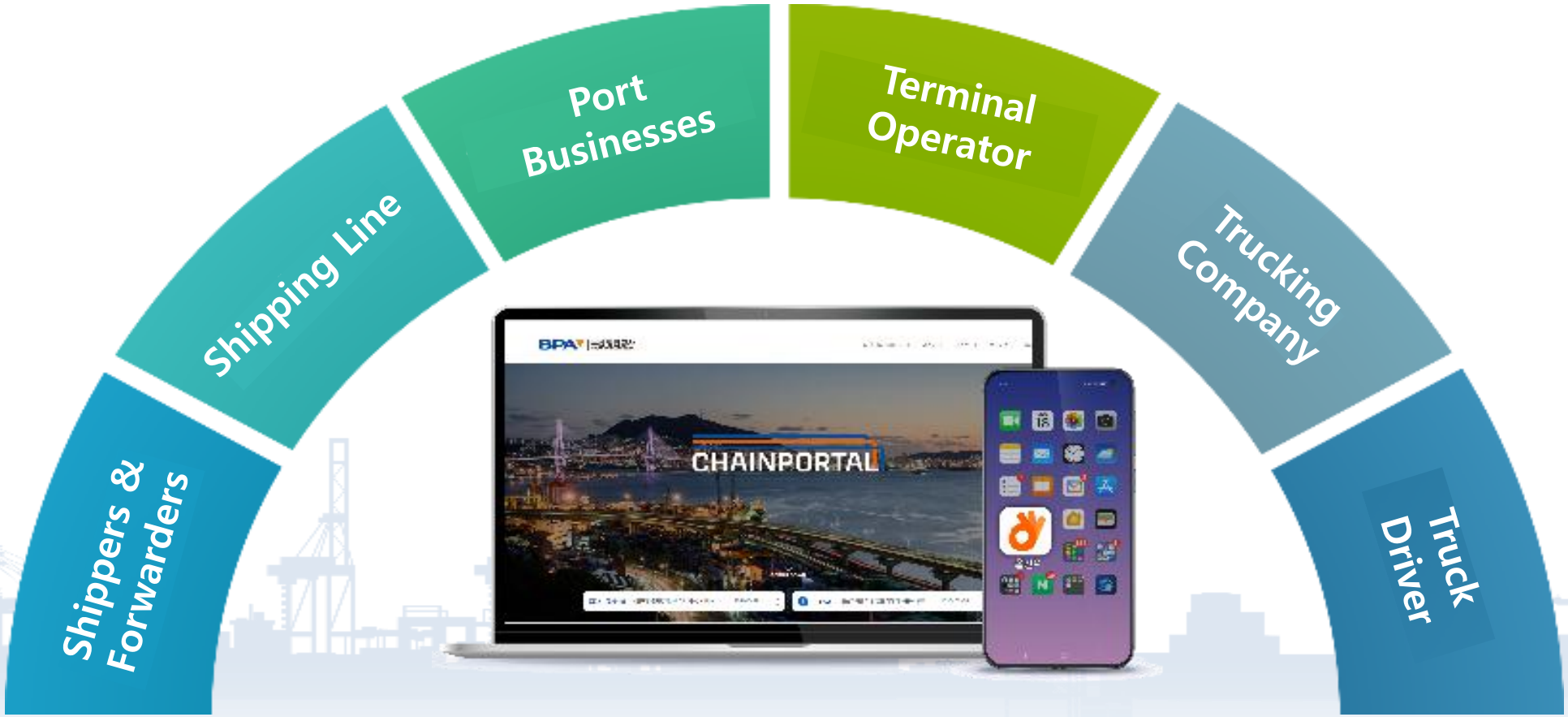
- Carrier
- TML Operator
- Port Authority
- Customs
- Shipper
- Forwarder
- Trucking Company
- Rail Operator
- Quarantine
- Logistics Company

Cargo Visibility ↑

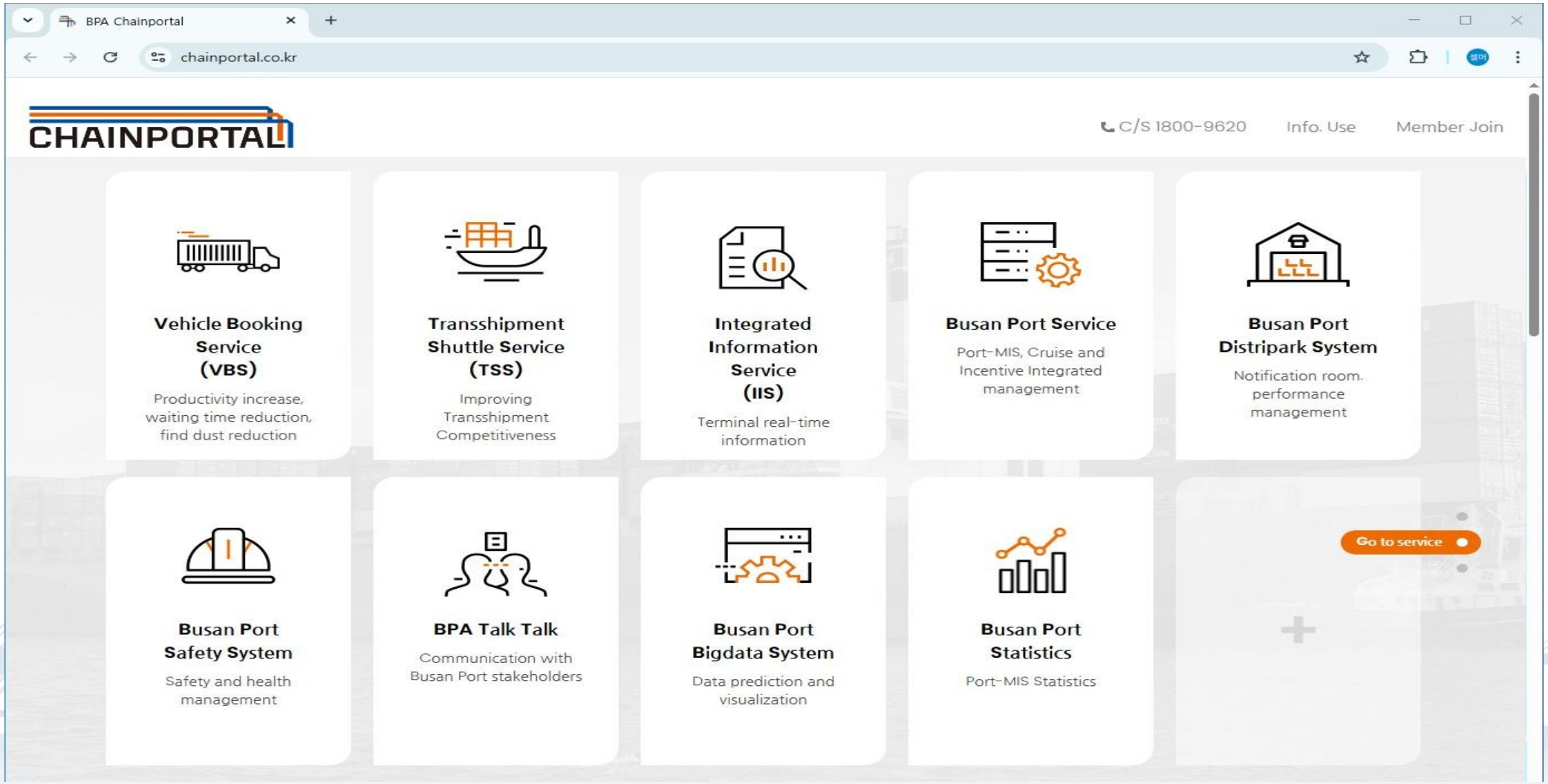
<World Bank>
- Singapore
- Rotterdam
- Busan

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

❶ 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

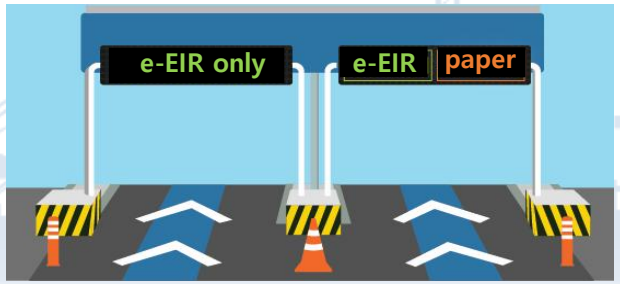
→

❷ 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

❸ Decide adoption

Hardware

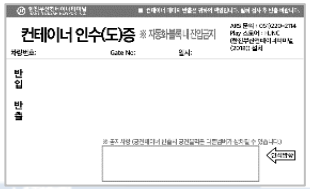


Installing dedicated e-EIR gates to facilitate efficient and secure entry and exit procedures

+

Software

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



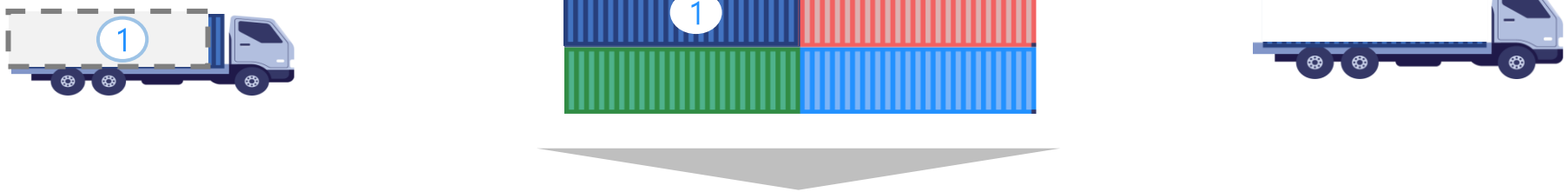
paper EIR

Driver walking along the large heavy machineries

Transshipment Support System(TSS)

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

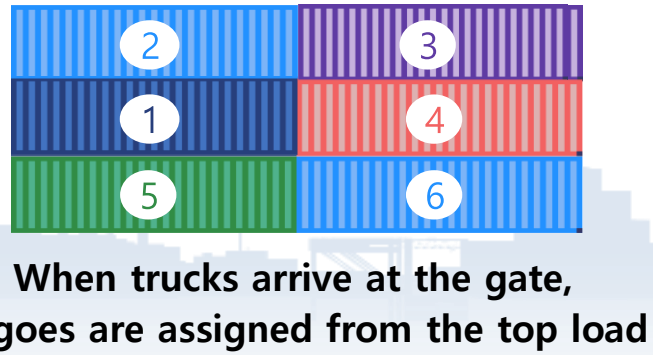
➔ Inefficiency and increased waiting time due to the location of cargoes



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

➔ Orders are automatically placed in the optimal order

Group shipping orders



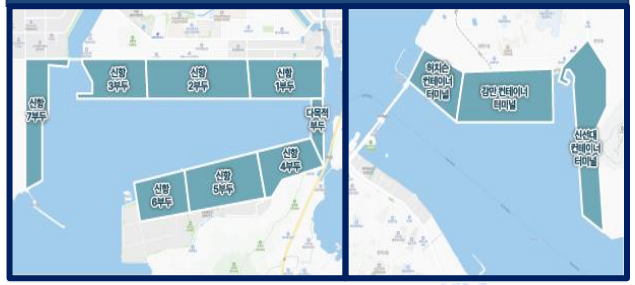
When trucks arrive at the gate,
cargoes are assigned from the top load

Busan Port-i

Transshipment Data Integration

01 Real-time Integration of Terminal Data

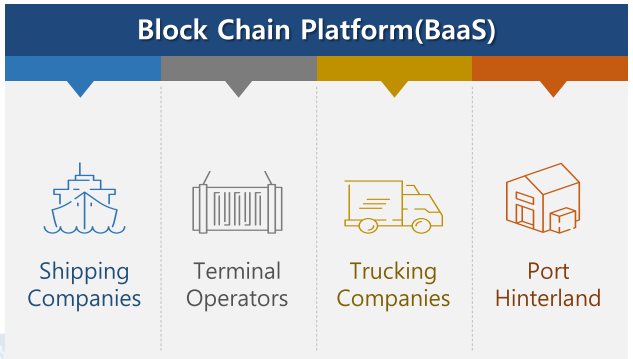
Data Sharing with Stakeholders



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

Strengthening Data Security

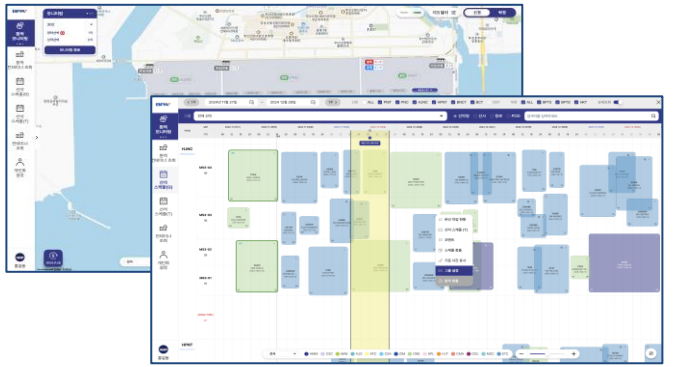
02 Utilization of Blockchain Technology



- Ensuring information integrity
- Guaranteeing the reliability of information

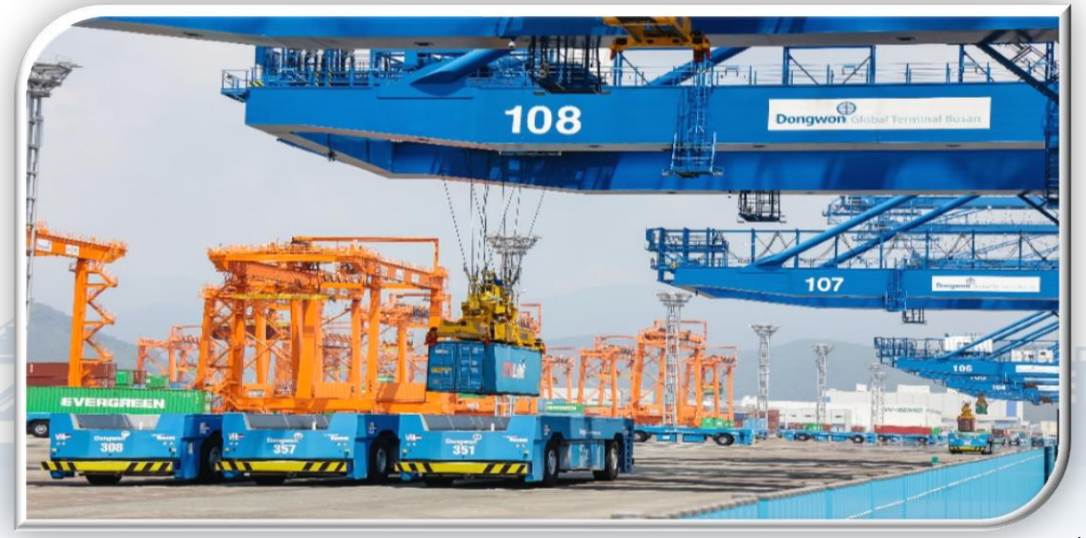
Enhancing Transshipment Competitiveness

03 Development of Transshipment Monitoring system(Port–i)



- Transshipment operations via a single platform
- Enhancing Transshipment efficiency

Fully Automated Terminal(New Port Pier 7)



THANK YOU

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