

Maritime Port Startup Fostering Governance

Startup to Growup onestop Platform



Community Building



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"Eco, Smart, and safe port"

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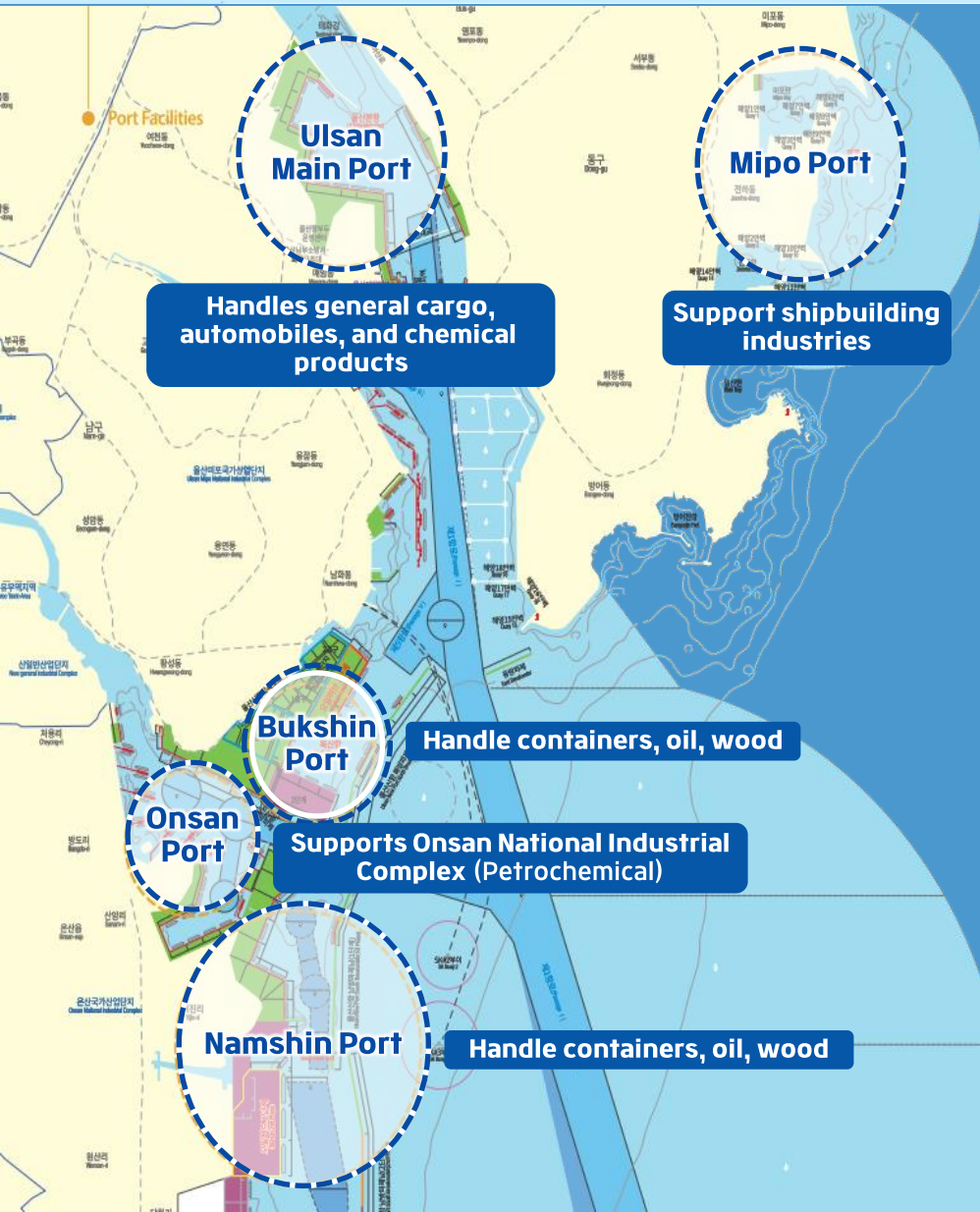
Talent fostering → Startup discovery →
Technology discovery → Marketing support

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Major platform operation performances



Ulsan Port Introduction



Ulsan Main Port

Handles general cargo, automobiles, and chemical products

Mipo Port

Support shipbuilding industries

Bukshin Port

Handle containers, oil, wood

Onsan Port

Supports Onsan National Industrial Complex (Petrochemical)

Namshin Port

Handle containers, oil, wood

Ulsan Port operation institutions



Ulsan Regional Oceans & Fisheries Administration



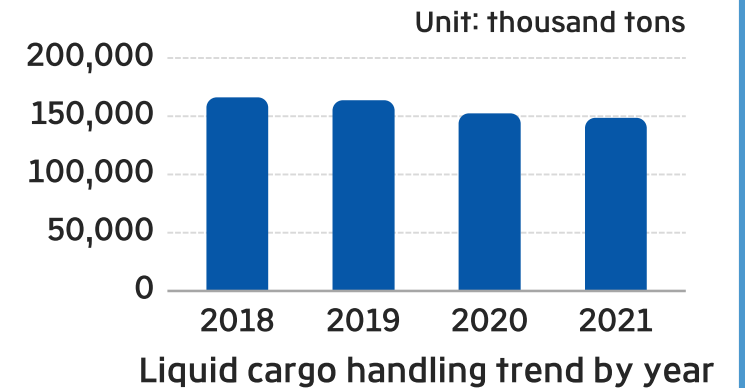
Ulsan Port Authority

Ulsan Port has developed into an industrial support port that supports the automobile, shipbuilding, and petrochemical industries located in the national **industrial complex**, and is equipped with a world-class petrochemical complex, oil refinery, and large-scale liquid cargo storage facilities.

It handles 33.8% of Korea's liquid cargo and 41.05% of crude oil, and is the **largest liquid cargo handling port in Northeast Asia**.

1st in Korea, 4th worldwide

World-class port



01 Background



Establishment of convergence talent development and startup fostering governance to achieve Ulsan Port's vision of 'creating an eco-smart port' and create quality jobs in the region

Vision of Ulsan Port

NEWSIS 지방 > 울산

Ulsan Port Authority proposes its 2030 vision of 'Leap toward energy specialized port'

등록 2022.11.01 16:05:55



Ulsan Port Authority's 2030 vision set as 'Realization of an eco, smart, and safe port'

In order to achieve the vision of 'realization of eco-smart ports', it is necessary to nurture excellent talents in the maritime port field and foster innovative companies



Eco

- ✓ Creation of an eco-friendly energy port
- ✓ Creation of eco-friendly port infrastructure

Smart
asafety

- ✓ Creation of eco-friendly port infrastructure
- ✓ Achievement of ZERO port with severe disasters

[Image description] UPA 2030 vision proclamation ceremony – 'Eco', 'Smart' port implementation goal setting

02 Platform overview



“ Startup To Growup Onestop Platform ”

Establishment of foundation for future growth of ports by lowering the threshold for start-ups in the maritime port sector and providing one-stop services from product demonstration of innovative technologies to support for sales channels

Establishment of government-public institution-local community maritime port start-up fostering governance to establish foundation for future growth

Government



3 ministries

University



2 universities



울산항만공사
ULSAN PORT AUTHORITY

Startup To Growup
Onestop Platform

Talent
fostering



Startup
discovery



Technology
development



Marketing



Company



8 companies

Public institutions



84 institutions

02 Platform overview



Achieving the vision of Ulsan Port and contributing to the growth of the local community through port startup growth support community operation



Overseas benchmarking support



Qualification system operation



Mentoring program operation



Operating a project lab in connection with local universities



Operating a project lab in connection with local universities

Nurturing talents (878 maritime logistics/ICT convergence talents, 134 professional talents)



Discovery of startups
(discovering 90 startups linked to local universities)

Startup To Growup Onestop Platform



Marketing (governmental and domestic/foreign market development support)



Technology development (12 startup collaboration technology development, test bed operation)



Domestic and overseas market development support



Government procurement product registration support



Provide technology demonstration test bed



On-site verification support related to technology development



Consulting support related to technology development



Mentoring education for fostering maritime logistics and ICT convergence talents and operation of professional certification system supervised by UPA

Maritime logistics x ICT convergence mentoring education

Project overview

A university student and an expert (mentor) form a team to carry out a project in the field of smart maritime logistics to foster convergence talents with practical skills.

Participants

Mentee: Any college student (regardless of major or grade)

Mentor: An employee with more than 5 years of practical experience

Procedure



Operation of professional certification system (smart maritime logistics manager)

Certification overview

Fostering experts who can perform office, management, and consulting tasks related to smart maritime logistics, such as smart ports, autonomous ships, and maritime communication, by utilizing logistics knowledge and ICT knowledge

Composition subject

Maritime logistics

ICT

Marine Logistics and Information and Communications regulations

Certification test schedule





Opening and operating smart maritime logistics-related start-up discovery channels to support entry into the port logistics industry

Startup discovery channel operation

Startup audition preliminary (Basic)

Top-down start-up audition that alleviates psychological barriers to start-up by first disclosing business models related to smart maritime logistics to prospective start-ups

1 Business model (BM) refinement led by experts such as business practitioners and university professors



1 Recruitment of prospective founders after BM disclosure



1 Startup training and funding



1 Review of additional support based on business promotion

Startup audition main round(advance)

Establish a foundation for commercialization through marketing (business plan) support to attract additional investment as well as venture consulting, technical advice, and prototype development support for startups with commercialization potential selected for additional support

1 Close support from venture consulting experts



1 In-depth technical advice, management training, prototype development support



1 BM advanced prototype supplementation and verification



1 Marketing in connection with government support projects (market, purchase support)

Fostering social enterprises

Discovering and fostering social enterprises that can solve local problems and create social values

1 Awareness of local social issues



1 Discovery of problem-solving social companies



1 Startup education and funding support BM advancement prototype supplementation and verification



1 Marketing in connection with government support projects (market, purchase support)



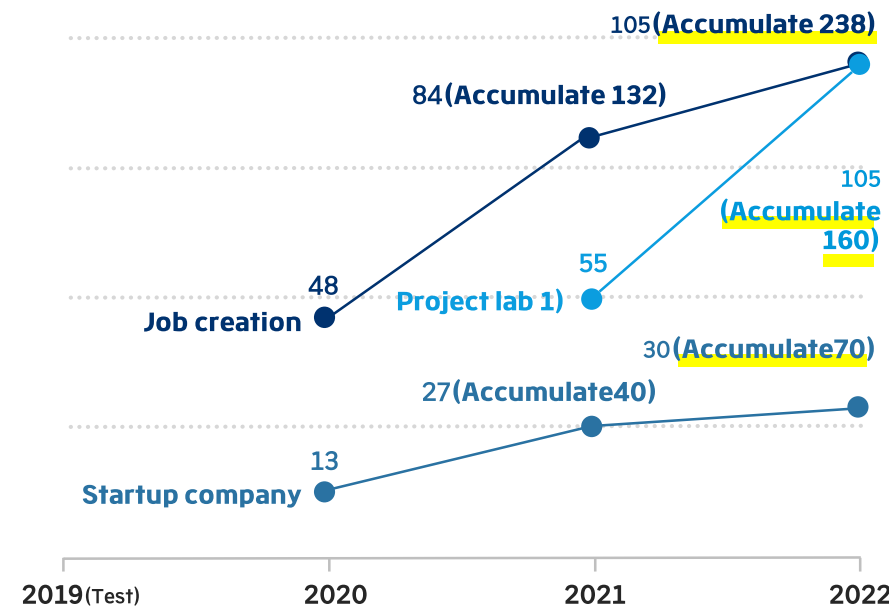
Implementation of complex support to resolve major difficulties of startups (lack of business funding, business competency training, etc.)



Startup support details

Fund support	Startup support of KRW 10 million in initial start-up funds and KRW 20 million in funds for preparing the foundation for commercialization
Space support	(Local university) Ulsan Institute of Science and Technology Convergence Campus + (Port) Pier Operation Center Startup Hideout
Education support	Startup education support including Tax / Accounting / Management / Market Research / Technology / Marketing / Public Relations, etc.
Consulting support	Excellent business model benchmarking consulting, prototype development-complementary consulting, R&D technology consulting, etc.
Competitiveness improvement	Improvement of the completeness of the final business plan to connect with government support projects, laying the groundwork for commercialization through prototype demonstrations, and learning best practices through overseas advanced port benchmarking training support <ul style="list-style-type: none"> Laying the groundwork for overseas market development

● Job creation (EA) ● Startup company (EA) ● Project lab (people)



1) Project Lab: An Edu+Working Group in which current technology development and market research tasks in specific fields are opened in the form of project-type R&D subjects, and students perform both the education and project execution required for each project.



Full support from start-up to growth, from support for technology advancement through test bed support and support for issuance of technical performance certificate

Test bed support

- ✓ Open UPA-owned facilities
[Representative open facilities]
- 11 mooring facilities
- 2 hinterland complexes
- construction site, etc.



Technology support

- ✓ Organize a pool of experts by field
 - Local governments, public institutions, etc.
- ✓ Technology development direction consulting
- ✓ Technology development direction consulting



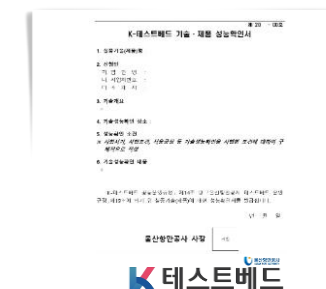
Financial support

- ✓ Collaboration with Credit Guarantee Fund
- ✓ Promotion of financial support for companies that have completed the test bed
- ✓ Provide various financial products for each stage of corporate growth



Technical performance certificate issuance support

- ✓ On-site evaluation team operation
 - Composition of internal and external members
 - Promotion of experiments, field inspections, etc.
- ✓ Technology products that pass the evaluation are issued a certificate of technical performance



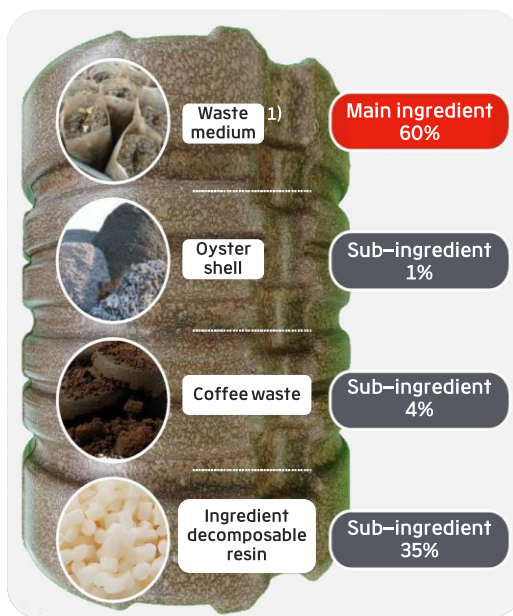


Eco-friendly start-up technology development support case for the realization of an eco-port in Ulsan Port 1

Eco-friendly buoy, wind power harvesting lighting device

Technology development case—Eco-port implementation

Eco-friendly buoy



Technical explanation

Development of eco-friendly fishing buoys using mycelium components of highly degradable mushrooms

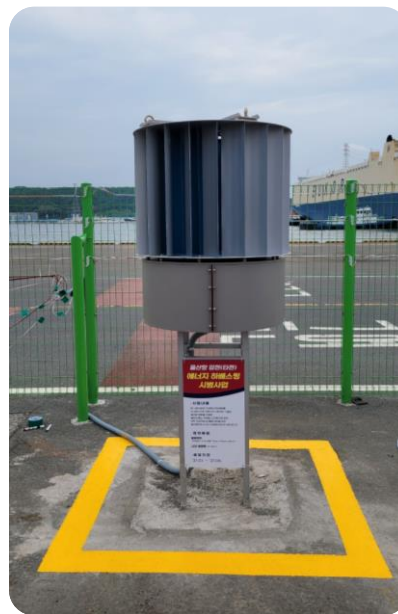
Performance

Technology development completed, field test bed in progress

Expected effect

- Prevents marine environment pollution by not generating microplastics
- Reduction of material costs by using more than 60% of the total waste resources

Wind power harvesting self-generation lighting device



Technical explanation

As the blade²⁾ rotates by the sea wind, it strikes the piezoelectric element³⁾ at the bottom to generate power and turn on LED lights

Performance

Technology development completed, commercialization in progress

Expected effect

- Possible to install safety facilities using new and renewable energy by installing in fishing villages and breakwaters where power is difficult to enter
- Reducing carbon emissions by improving the use of renewable energy

1) Waste medium: Remnants of medium left over from mushroom cultivation 2) Blade: A part that rotates by wind 3) Piezoelectric element: A material that converts vibration into electrical energy



Case of eco-friendly start-up technology development support for the realization of an eco-port in Ulsan Port 2

Functional offshore structures using eco-friendly hull fouling organisms treatment technology and

Technology development case—Eco-port implementation

Development of hull attached organism treatment technology



Technical explanation

Technology to suppress the generation of organisms attached to the hull using microcurrent

Performance

Technology development completed, field test bed in progress

Expected effect

- Increase ship fuel efficiency
- Resolving secondary contamination and high cost compared to physical and chemical removal

Functional offshore structure reinforcement coating



Technical explanation

Improved durability and eco-friendliness of offshore structures through the development of eco-friendly solvent-free¹⁾ paints

Performance

Technology development completed, field test bed in progress

Expected effect

- Contribution to greenhouse gas reduction and enhancement of facility eco-friendliness by minimizing the use of petroleum resources

1) Solvent-free: Paint that does not use liquids for dissolution such as gasoline or alcohol (low environmental pollution and safe operation)

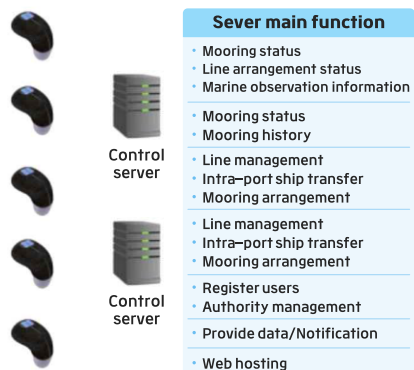


Case of supporting ICT start-up technology development for the realization of Ulsan Port Smart Port 1

Smart mooring technology, AI-based vessel docking monitoring system

Technology development case—Smart port implementation

Harbor control system using smart mooring poles



Technical explanation

Strengthening port facility management through real-time monitoring of vessel traction power

Performance

Technology development completed, field test bed in progress

Expected effect

- Prompt response to risk factors through real-time monitoring of traction force
- Improving economic feasibility and safety by reinforcing mooring facilities customized for each berth through data accumulation

Artificial intelligence port environment recognition-based berthing monitoring system



Technical explanation

Serves as a safe auxiliary system in the berthing process, such as the distance between the ship and the pier, the berthing speed, and the distance between ships

Performance

Technology development completed, field test bed in progress

Expected effect

- Conductor data construction and analysis
- Berthing route planning and vessel collision prediction
- Securing ship docking safety



Case of supporting ICT start-up technology development for the realization of Ulsan Port Smart Port 2

Deep learning smart crane, big data-based port industry solution program

Technology development case—Smart port implementation

Smart crane safety detection system



Technical explanation

Identification of safety risk factors within the radius of the crane through AI learned through deep learning

Performance

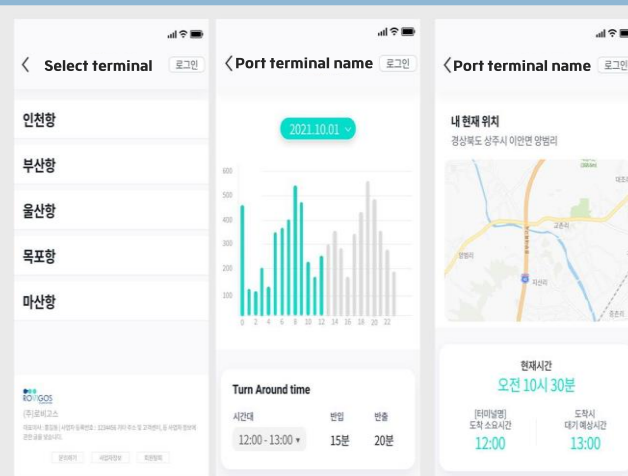
Installation in gantry crane, testing in progress

Expected effect

- Safety accident prevention effect in the port

Artificial intelligence solution for port container business

All-In-One Solution for vehicle waiting time and reservation by port terminal



Technical explanation

Provides data management and artificial intelligence analysis solutions through cloud server-based web/app

Performance

Technology development completed, field test bed in progress

Expected effect

- Increase port industry productivity and efficiency

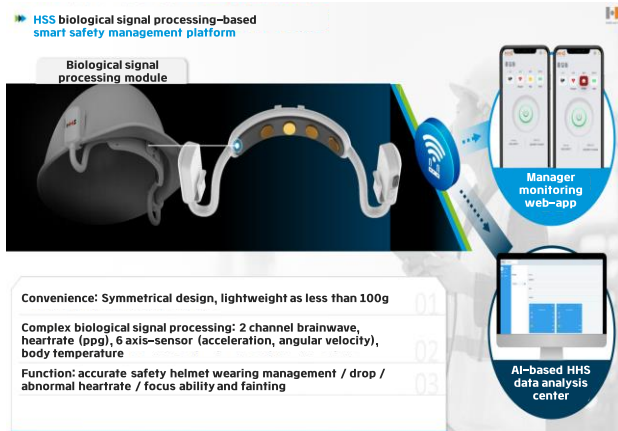


Start-up technology development support case for the realization of a safe port in Ulsan Port

Smart safety management platform based on biological signal processing, cryogenic hose reel

Technology development case—Facility management efficiency

Smart safety management platform based on biological signal processing



Technical explanation

Real-time physical condition monitoring of field workers through brain wave signal processing module

Performance

Technology development completed, field test bed in progress

Expected effect

- Preventing casualties through real-time inspection of biosignal information of field workers

LNG cryogenic hose reel and transfer equipment



Technical explanation

Improvement of LNG bunkering safety and efficiency through the development of convenient and safe LNG cryogenic hose reel

Performance

Completed test bed, preparing for sale to shipping companies and shipyards

Expected effect

- Truck To Tank type
Reinforcing LNG bunkering safety

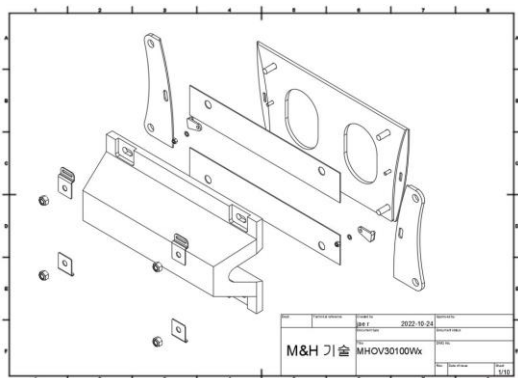


Technology development support case for facility management efficiency in Ulsan Port

Modular insect repellent fixing device, sand mastic repair and reinforcement method

Technology development case—Facility management efficiency

Modular prefabricated panther fixtures



Technical explanation

Only the damaged module¹⁾ can be replaced when the fixed frame is damaged through the modular design of the fixed frame of the insect repellent

Performance

Technology development completed, field test bed in progress

Expected effect

- Compared to products installed directly on the quay wall, a budget saving effect of about KRW 500,000 per unit
- Reduction of material costs by using more than 60% of the total waste resources

Port facility repair and reinforcement method using sand mastic



Injection of sandmastic mixture into the plant when underwater



Sand mastic underwater test construction (150 ~ 180)



Sand mastic construction (1st to 3rd injection)



Sand mastic construction completed (cement mortar finish)

Technical explanation

Improvement of facility stability by increasing the friction coefficient of foundation rubble²⁾ and backfill rubble³⁾ using asphalt mixture

Performance

Technology development completed, field test bed in progress

Expected effect

- Improvement of safety by preventing scouring⁴⁾ of port facilities
- Expected to increase service life through preventive maintenance of port facilities exposed to salt

1) Modularization: Dividing an object into smaller units

1) Sandmastic: Asphalt mixture used to prevent scour by injecting into foundation rubble and backfill rubble

2) Foundation rubble stone: A pile of stones that supports the bottom of the quay structure

3) Backfill rubble stone: A pile of stones piled up on the back side of the quay wall structure

4) Scour: A phenomenon in which rubble stones that support structures are lost due to seawater flow or waves.



Government marketing support for stable market entry of startups within the platform

B2G marketing support

SOC technology market¹⁾ registration

Purpose

To create a market environment for win-win cooperation by serving as a stepping stone for participation in public procurement of SMEs' innovative technologies and products

Institute

Participation of 22 SOC public institutions including Ulsan Port Authority

Details

Act as a channel for introducing and sharing new technologies, and support sales such as promoting technology and products for SMEs



[Image description] SOC Technology Market Registration Certificate (issued by the Korea Public Institutions Council)

Linkage with innovative procurement business²⁾

Purpose

To establish the foundation for initial sales growth by matching the purchasing power of public institutions with innovative technologies (products) of private companies

Institute

Public Procurement Service and public institutions

Details

Our corporation promotes registration of innovative products through administrative support for start-ups lacking public procurement information, and supports sales growth by linking to pilot purchase projects



[Image description] Online mall dedicated to innovative products (operated by Korean public institutions)

1) 'Integrated Technology Market Platform' that provides comprehensive support for small and medium-sized venture companies' ideas in the SOC field to securing sales channels

2) Korean government support project to support the vitalization of innovative products and the development of corporate markets



Support for UPA business-linked marketing for start-up company technology and domestic and international market development

B2C or B2B marketing support

Domestic marketing support



2021 Ulsan Port Eco Smart Port Event Product Exhibition



2022 Performance briefing product promotion



Participated in the CIVIL EXPO



Participation in overseas fairs (development of overseas markets) (creating overseas markets)



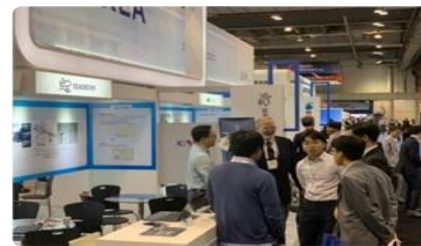
Singapore Port Authority visit and introduction



Participated in the Vivatech(France)



Participated in Houston Marine Technology Fair (USA)



Participated in TechBBQ (Denmark)



04 Platform operation performance – Representative case



Going beyond Ulsan Port to the world! Success in commercializing the world's first AI-applied vessel docking monitoring system!

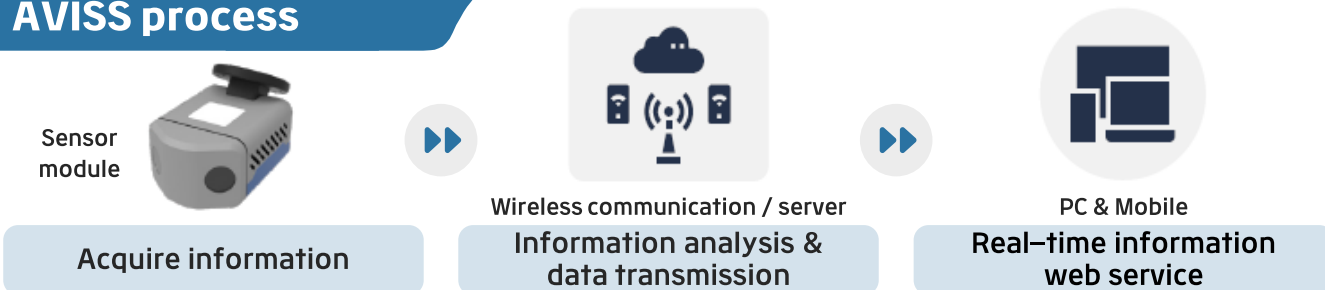
 **Around View Intelligence System for Ship (AVISS) | The world's first AI-applied vessel berthing monitoring system expansion and successful case of attracting investment**

AVISS introduction

- ✓ Provides real-time situation information through automatic analysis of the surrounding environment of the ship docking based on AI technology
- ✓ Provide auxiliary port operation data from vessel arrival to departure → enhance operational efficiency and safety



AVISS process



Successful Investment attraction

Representative cases of introducing major ports nationwide

Incheon Port
• Incheon liquid vessel quay

3EA



Ulsan Port
• Ulsan liquid quay
• Ulsan Yanggok quay

5EA



Yeosu/Gwangyang Port
• Jungheung quay
• Nakpo quay

2EA



04 Platform operation performance—Representative case

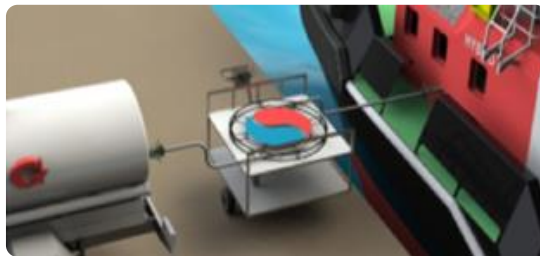
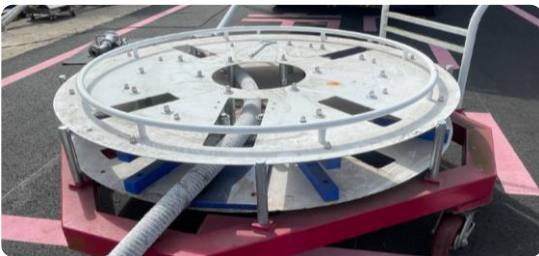


**Successful commercialization of safe and convenient LNG bunkering hose reel
with ONESTOP support from start-up technology development of public institutions
(UPA, KOEM*) to demonstration and advancement!**

LNG Bunkering hose reel | Equipment for safe and convenient Truck To Ship bunkering of LNG propulsion ships

Product information

- ✓ Although LNG propulsion ships are expanding due to IMO regulations, etc., inefficient methods such as installing and operating hoses directly by workers during bunkering are improved
- ✓ By developing a hose reel that can be moved and easily installed, safe and efficient LNG bunkering is possible



Key performance

**"Supporting the growth of startups through organic collaboration
between port operating institutions and ship operating institutions"**

- ✓ (UPA) Financial and technical support for technology development
- ✓ (KOEM) Provision of demonstration opportunities for LNG propulsion ships in possession
- ✓ (Start-up) technology development and acquisition of various certifications from accredited institutions





Performance of 'Startup to Grow Up one stop platform' from 2018 to 2022



Fostering convergence people

878 people



Fostering professional personnel

134 people



Startup discovery

90 EA



Job creation

257 people



Investment attraction

KRW **10** billion



Company sales

KRW **4** billion

**Through building the platform,
Ulsan Port Authority**
supports the strong leap toward the future of local talent,
from the beginning of a port startup company to its growth

