

Ulsan Port's world's first green methanol and biodiesel container  
Ship fuel supply

# Towards Carbon Neutrality : First Step in the World

Climate energy field



# Ulsan Port History

Designated as an international port on September 25, 1963,  
**it has grown into a global port** through continuous expansion and development.



International port designation  
 1963.9.25



Harbor line expansion  
 1989/1993



North New Port opens (UNCT)  
 2009



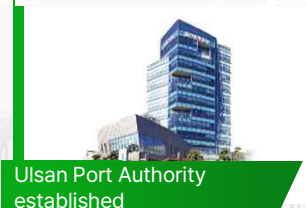
50th anniversary of Ulsan Port opening  
 2013.9.25



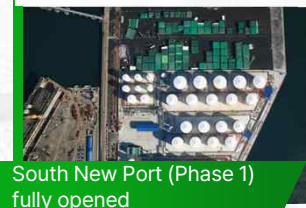
Port hinterland complex opened  
 2014/2017



Incorporation of Onsan Port and Mipo Port  
 1973/1976



Ulsan Port Authority established  
 2007



South New Port (Phase 1) fully opened  
 2012



Creation of Energy Hub (Phase 1)  
 2013



Ulsan Port  
 60th anniversary of port opening  
 2023.9.25



Port Cargo Volume

3 million tons ▶▶ 13 million tons ▶▶ 62 million tons ▶▶ 151 million tons ▶▶ 169 million tons ▶▶ 191 million tons ▶▶ **193 million tons**



Annual Unloading Capacity

0.5 million tons ▶▶ 1.47 million tons ▶▶ 18 million tons ▶▶ 25 million tons ▶▶ 52 million tons ▶▶ 69 million tons ▶▶ **78 million tons**

Annual unloading capacity: Excluding oil dock unloading capacity (oil pipeline unloading method)

# Introduction to Ulsan Port

## Ulsan Port, Korea's largest industrial support port !

**Korea's largest liquid cargo handling port**  
(handles approximately 30% of domestic liquid cargo)

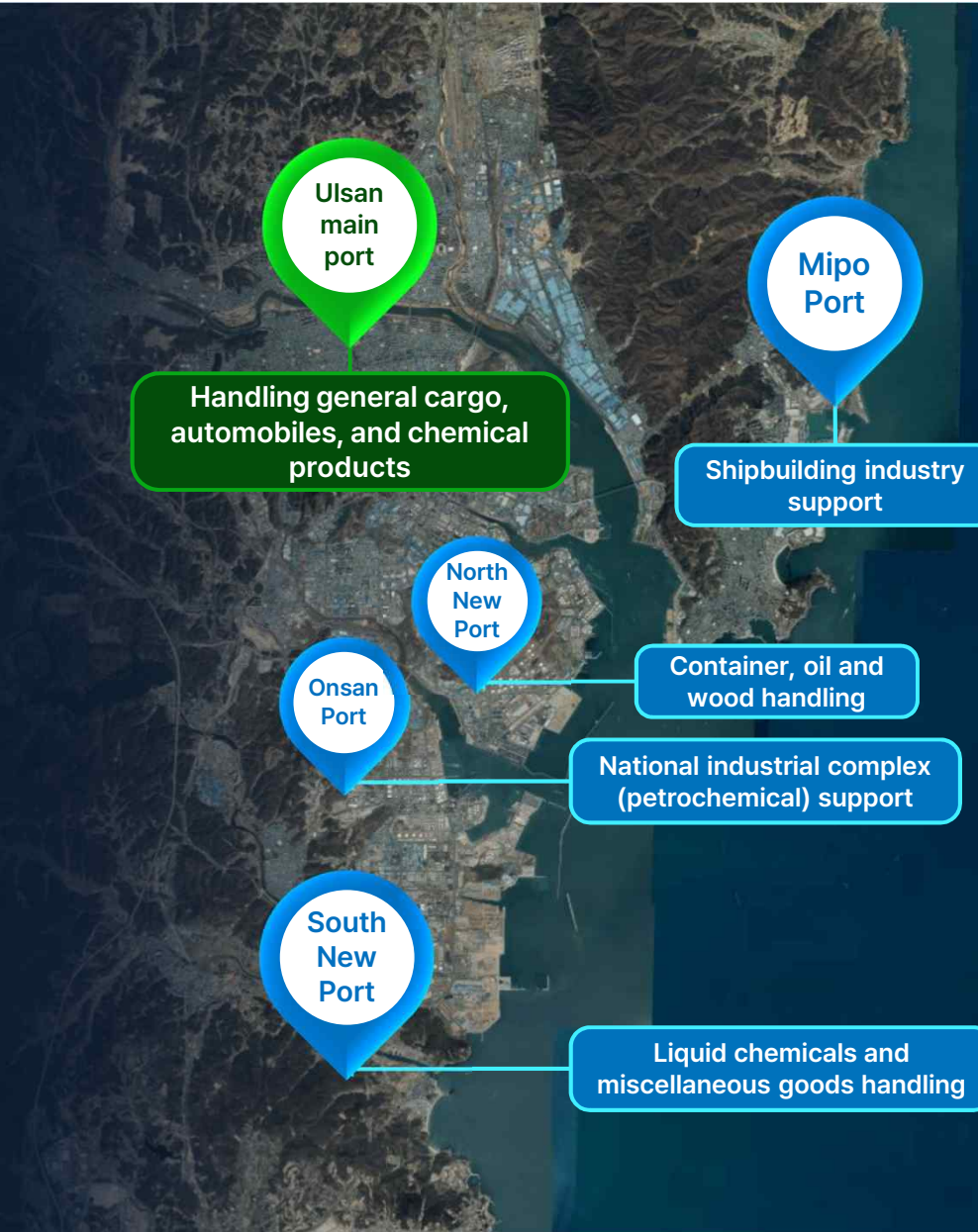
Following the Top 3 Oil Hub Ports,  
**Ulsan Becomes the World's 4th Largest  
Liquid Cargo Handling Port**

Wharf wall extension	Berthing capacity	Anchoring capacity	Unloading capacity	Yard capacity	water surface area in port	Coastline length	The ebb and flow of time
977.4M (including pier)	122 ships (7,735,500 DWT)	42.51km <sup>2</sup>	77,949 thousand tons	3,676 thousand tons (1,155 thousand m <sup>2</sup> )	114km <sup>2</sup>	58km	60.8cm

\*Including private docks, excluding other mooring facilities

Division	Length(M)	Water Depth (M)	Berthing capacity		Unloading capacity (thousand tons)	Main cargo handled
			Tonnage (DWT)	Number of Ships		
Ulsan main port	10,085	7~17	1,815,500	60	32,276	Oil, coal, automobiles, etc.
Onsan Port	5,073	7~27	1,807,000	33	18,270	Oil, chemicals, etc.
Mipo Port	210	9	20,000	1	990	steel
Ulsan New Port	6609.4	7~17	1,093,000	28	27,116	Liquid chemicals, containers, etc.

Division	Length(M)	Usage
Outer mooring facilities	3,017	Tugboat waiting area, ferry, fishing boat mooring area, ship block unloading wharf, new ship outfitting quay, small ship mooring area, miscellaneous ship mooring area, etc.



# Ulsan Port Vision

**Creating a Northeast Asian energy hub port**  
by expanding the supply of eco-friendly fuels such as LNG, hydrogen, and methanol

## 4 New Strategy System Chart

Eco-smart port leading energy logistics			
Leading the future (Future Leading)	Customer first (Customer First)	Innovation-oriented (Innovation Oriented)	social responsibility (Social Responsibility)
20% of new business sales	Traffic volume : 210 million tons	Debt ratio less than 20%	U-ESG Index S grade
<b>Leading energy logistics port</b>	Implementation of a high value-added port	Improved management efficiency	Realization of sustainable management
<b>1 Strengthening oil (liquid) logistics hub</b> <ul style="list-style-type: none"> <li>Expansion of liquid cargo handling infrastructure</li> <li>Attracting and revitalizing commercial tank terminal investment</li> <li>Energy Hub Stage 1 Activation</li> </ul>	<b>4 Creation of port demand and cargo volume</b> <ul style="list-style-type: none"> <li>Strengthening marketing to attract port cargo volume</li> <li>Efficient operation of hinterland complexes and support for tenant companies</li> <li>Establishment of overseas complex logistics center</li> </ul>	<b>7 Organizational management efficiency</b> <ul style="list-style-type: none"> <li>Strategic organizational operation and strengthening of expertise</li> <li>Establishment of a fair and transparent personnel system</li> <li>Establishment of a competency-centered performance management system</li> </ul>	<b>10 Construction of a safe port</b> <ul style="list-style-type: none"> <li>Advancement of port safety management</li> <li>Strengthening systematic disaster management</li> <li>Strengthening port security</li> </ul>
<b>2 Leap forward as a leading LNG port</b> <ul style="list-style-type: none"> <li>Construction of LNG terminal and storage facility</li> <li>Increase in LNG demand</li> <li>Providing LNG bunkering services in the southeastern region</li> </ul>	<b>5 Strengthening port operation competitiveness</b> <ul style="list-style-type: none"> <li>Port facility performance improvement and maintenance</li> <li>Increasing dock productivity and operational efficiency</li> <li>Enhancing customer satisfaction and improving service</li> </ul>	<b>8 Strengthening financial soundness</b> <ul style="list-style-type: none"> <li>Expanding financial soundness and growth potential</li> <li>Strategic financing and operation</li> <li>Efficient budget planning and operation</li> </ul>	<b>11 Eco-friendly port operation</b> <ul style="list-style-type: none"> <li>Strengthening port air quality management</li> <li>Implementation of a carbon-neutral port</li> <li>Creating an eco-friendly port ecosystem</li> </ul>
<b>3 Creation of an eco-friendly energy specialized port</b> <ul style="list-style-type: none"> <li>Establishment of methanol, ammonia and hydrogen infrastructure</li> <li>Establishment of a pier to support floating offshore wind power generation</li> <li>Establishing a global eco-friendly marine fuel supply chain</li> </ul>	<b>6 Smart port implementation</b> <ul style="list-style-type: none"> <li>Digitalization of port operation system</li> <li>Expanding digital application in port construction</li> <li>Creating a smart industrial ecosystem</li> </ul>	<b>9 Management innovation</b> <ul style="list-style-type: none"> <li>Service innovation such as regulatory reform and proactive administration</li> <li>Advancement of job-centered compensation system and welfare benefits</li> <li>Internalization and diffusion of innovation activities</li> </ul>	<b>12 Implementation of corporate shared values</b> <ul style="list-style-type: none"> <li>Strengthening ethical management and human rights management</li> <li>Strengthening public communication and labor-management cooperation</li> <li>Realization of shared growth and win-win cooperation</li> </ul>





# Ulsan Port Status

- ▶ liquid cargo handling Possessing infrastructure and know-how
- ▶ behind the scenes industrial complex and Abundant industrial demand (automotive, shipbuilding, etc.)
- ▶ Serves as a bunkering supply base for ports in the southeastern region of Korea
- ▶ Possesses the nation's No. 1 commercial tank terminal

- ▶ Global eco-friendly energy paradigm shift
- ▶ industry behind Carbon neutrality and RE100 activation
- ▶ Government policy to create new eco-friendly energy industries and markets (National Task No. 21)



Ulsan Port **leaps forward as a global eco-friendly energy logistics hub** to improve competitiveness and achieve sustainable growth !



# 'Ulsan Port', an eco-friendly energy specialized port

## Ulsan Port, a carbon-neutral destination for eco-friendly ship fuel



- ▶ Global marine fuel paradigm shift, including 2050 IMO policy
- ▶ There is a need to secure a leading infrastructure for supplying eco-friendly marine fuel within ports.



Ulsan Port's competitiveness as an energy hub in Northeast Asia  
**Dominating the global eco-friendly marine fuel bunkering market**



### Why Ulsan Port?

#### Korea's largest methanol import port

Processing of 1.2 million tons per year  
 About 40% of domestic imports

#### Existence of storage and supply infrastructure

Methanol can be handled  
 11 commercial tank terminal located in ulsan

#### Southeastern port supply base

Global 'container' Port Busan Port  
 Bunkering demand response  
 (Sea distance from Ulsan Port is only 60km)

#### Connecting demand from the hinterland industrial complex

There is demand for pilot bunkering with methanol fueled vessels built by local shipbuilders.  
 own a methanol handling tanker terminal

### Plan to build an eco-friendly marine fuel supply chain (Ministry of Oceans and Fisheries/November 2023)



public initiative  
 Eco-friendly marine fuel Supply and Procurement



Shipping port type  
 Establishing a virtuous cycle system for the eco-friendly fuel industrial ecosystem



korea, Becoming a base for supplying eco-friendly marine fuel in Northeast Asia

Ulsan Port designated as  
**'eco-friendly marine fuel supply port'**

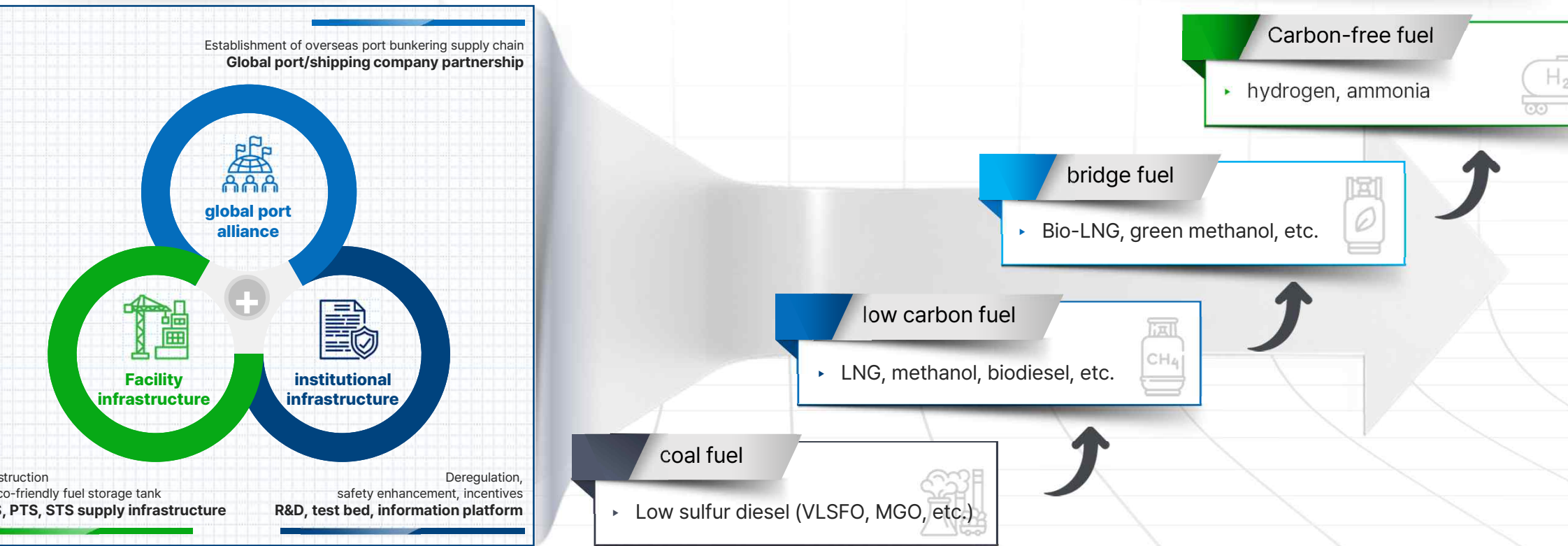


# 'Ulsan Port', an eco-friendly energy specialized port

## Ulsan Port, a carbon-neutral destination for eco-friendly ship fuel

Based on our strengths differentiated from other ports, we have taken the lead in securing **fossil ( carbon ) → low carbon → zero carbon fuel** infrastructure.

**Providing all bunkering services optimized to the needs of** port users in the southeastern region of Korea





# Step-by-step implementation of the world's first green methanol/biodiesel container ship fuel supply

## STEP 1

## Establishment of Ulsan Port methanol bunkering new project implementation plan ('22.11)



Analysis of domestic and international trends and preparation of plans for institutional improvement to respond to the demand for methanol ship fuel utilizing infrastructure at liquid cargo-focused ports

## STEP 2

## Signed a business agreement to create methanol bunkering infrastructure



- ▶ Establish a cooperation system and collaborate with Korea Register of Shipping(KR)and leading domestic shipbuilders to create infrastructure for the methanol-fueled vessel and bunkering market.
  - UPA- Korea Register of Shipping (KR): Ulsan Port methanol risk assessment and safety checklist development  
Joint research establishes a foundation for domestic methanol bunkering safety procedures
  - UPA-HD Korea Shipbuilding & Offshore Engineering HD Hyundai Heavy Industries : Supply of methanol marine fuel for test runs and cooperation in resolving bunkering regulations to create a foundation for expansion of ship exports in the domestic shipbuilding industry.



# Step-by-step implementation of the world's first green methanol/biodiesel container ship fuel supply

## STEP 3

Ulsan Port attracts methanol bunkering from global companies (March 2023)



Actively engage in port sales collaborating tank terminal targeting shipping companies (Maersk), and green methanol production companies (OCI) to attract methanol bunkering to Ulsan Port.

## STEP 4

The first step toward implementing methanol bunkering, holding a seminar (April 2023)



- ▶ Seek ways to secure the legal status of methanol as a ship fuel
- ▶ Brainstorming on methanol unloading, bunkering, and safety management with expert participation

## STEP 5

Methanol container ship bunkering council (TF) formed (May 2023)



- ▶ Establish a TF led by UPA and concentrate the capabilities of key organizations
  - UPA, Ministry of Oceans and Fisheries, Maersk, OTK, HD Hyundai, KR, methanol supplier, etc.
- ▶ Prompt and comprehensive response to solve difficulties in eco-friendly ship fuel bunkering

# Step-by-step implementation of the world's first green methanol/biodiesel container ship fuel supply

## STEP 6

Eco-friendly marine fuel site inspection and meeting held (June 23)



## STEP 7

The world's first methanol-fueled container ship Successful green methanol bunkering in Ulsan Port ('23.7.15~16)



### World's first methanol-powered container ship begins maiden voyage

Maersk Solstice is heading to Europe after completing first bunkering in South Korea

17 July 2023 9:42 GMT UPDATED 17 July 2023 9:59 GMT

By Gary Dixon in London

The world's first container ship powered by methanol has begun its debut trip from South Korea

- ▶ Preempt the eco-friendly fuel bunkering service at Ulsan Port by pioneering the green methanol bunkering new market amidst keen competition among global ports

Continuously ensure seamless preparations by conducting methanol PTS (Port to Ship) bunkering pier inspections and preliminary safety checks with the participation of the Ministry of Oceans and Fisheries, shipping companies, and tank terminals.



# MISSION SUCCESS



achieving the **world's first** supply of green methanol and biodiesel as fuel for container ships.

In a situation where forming a consensus, participation, and collaboration among various stakeholders is crucial, in order to succeed in methanol bunkering,

01

The time it took to resolve pending issues through **swift administrative processing**, serving as a bridge and coordinator between the government and the private sector



4

months

02

The time it took when the dream of becoming the **world's first to supply green methanol and biodiesel as fuel** for container ships became a reality



9

months



# Three missions for success in supplying green methanol and biodiesel container ship fuel

## first challenge



**Biodiesel and methanol,  
Absence of legal status  
as marine fuel**

## second challenge



**Lack of dedicated vessels for  
methanol fuel supply and  
prohibition of engaging in both  
domestic transportation and  
bunkering**

## Third challenge



**Absence of safety procedures for  
methanol fuel supply and lack of  
demonstration of methanol  
bunkering for domestic and  
international container ships**



# Absence of legal status for biodiesel and methanol as marine fuel

First difficulty Biodiesel and methanol: Absence of legal status as marine fuel

## Biodiesel



Prohibition of selling biodiesel as fuel for automobiles, etc., under the Petroleum Business Act



**Conditional tax exemption** for the sale of ship fuel is unclear under the Transportation, Energy, and Environment Tax Act

## Methanol



Only petroleum products are specified as ship fuels under the Petroleum Business Act and the Individual Consumption Tax Act



Methanol and other environmentally friendly energy sources are not explicitly specified as **ship fuels, making it difficult** to obtain permission to load methanol as ship fuel rather than cargo.

# Absence of legal status for biodiesel and methanol as marine fuel

First difficulty Biodiesel and methanol: Absence of legal status as marine fuel

Consultation completed on allowing the sale of biodiesel as ship fuel and granting permission to load methanol.

Promoting legislation to use environmentally friendly energy for ship fuel under the Petroleum Business Act

## 1. Ministry of Trade, Industry and Energy

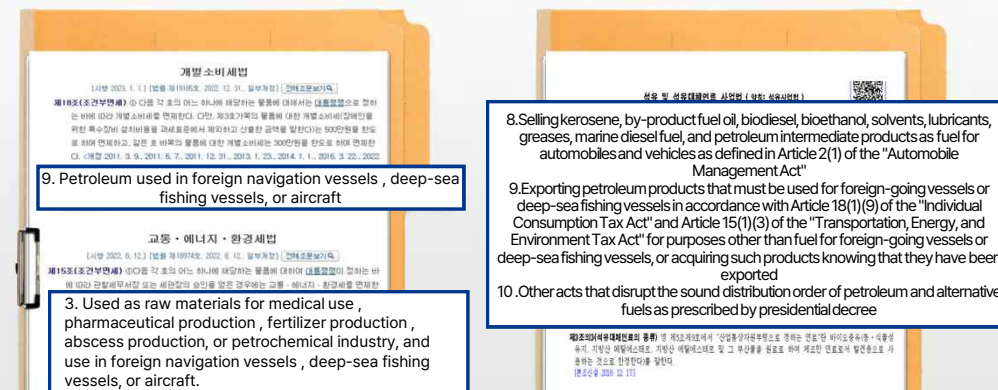
### Confirmation that biodiesel can be sold as marine fuel

\*(Rationale) There are no regulations restricting the sale of biodiesel other than automobile fuel under relevant laws.



## 2. National Tax Service

According to the Transportation, Energy, and Environmental Tax Act, biofuel is used on foreign navigation ships. Confirmation of conditional tax exemption upon supply and approval by customs director (Ministry of Oceans and Fisheries, tax law interpretation, etc.)



9. Petroleum used in foreign navigation vessels, deep-sea fishing vessels, or aircraft

3. Used as raw materials for medical use, pharmaceutical production, fertilizer production, abscess production, or petrochemical industry, and use in foreign navigation vessels, deep-sea fishing vessels, or aircraft.

8. Selling kerosene, by-product fuel oil, biodiesel, bioethanol, solvents, lubricants, greases, marine diesel fuel, and petroleum intermediate products as fuel for automobiles and vehicles as defined in Article 2(1) of the "Automobile Management Act"

9. Exporting petroleum products that must be used for foreign-going vessels or deep-sea fishing vessels in accordance with Article 18(1)(9) of the "Individual Consumption Tax Act" and Article 15(1)(3) of the "Transportation, Energy, and Environment Tax Act" for purposes other than fuel for foreign-going vessels or deep-sea fishing vessels, or acquiring such products knowing that they have been exported

10. Other acts that disrupt the sound distribution order of petroleum and alternative fuels as prescribed by presidential decree

세무서장(국세청장)의 통령 중 제10조제1항에서 '신용상자(신용카드)로 발급된 신용카드를 사용하여 결제된 것으로 인정되는 경우'에 대한 설명은 별첨된 별첨 10에 있습니다.





# Lack of domestic methanol handling marine fuel suppliers(ships) and safety procedures

the second difficulty lack of domestic methanol handling marine fuel suppliers(ships) and safety procedures

Existing oil bunker ships cannot handle methanol.

In the case of methanol, due to the toxicity and corrosiveness of the cargo, **existing ship fuel tanks cannot be used**

Absence of domestic methanol-only bunker vessels

High costs and long time required for retrofitting or new construction of methanol-dedicated bunker vessels.

Based on the domestic shipping notification, **methanol transport vessels cannot simultaneously perform coastal transportation and bunkering**

Absence of domestic methanol-related safety procedures

Methanol is a low flashpoint fuel that requires separate safety management procedures, but there are **no relevant domestic procedures**.





# Lack of domestic methanol handling marine fuel suppliers(ships) and safety procedures

the second difficulty lack of domestic methanol handling marine fuel suppliers(ships) and safety procedures

**Establishing a foundation for realizing STS fuel supply by securing methanol fuel supply vessels through the revision of the domestic shipping notification by the Ministry of Oceans and Fisheries.**

**Completion of tank terminal ship fuel supply business registration and risk assessment (verification).**

**Pushing for allowing domestic cargo transport companies to register as ship fuel supply businesses under the Shipping Act.**

**\*\*Utilizing tank terminals that store and unload methanol for fuel supply.\*\***

- 1 By registering as a ship fuel supply business for the first time at Ulsan Port's tank terminal, it is now possible to supply fuel from the pier. Registration allows fuel supply at the dock
- 2 Completed the revision of shipping-related notifications to allow methanol transport vessels to supply fuel.
- 3 UPA completed the development of a methanol bunkering risk assessment and safety checklist.
  - Korean Register (KR) conducted a risk assessment and safety procedure verification for methanol bunkering.

- ✓ Utilizing the proviso conditions for ship fuel supply businesses within the Enforcement Rules of the Port Transportation Business Act, a tank terminal company storing green methanol was registered as a ship fuel supplier for the first time and provided services.
- ✓ Enhancing safety and overcoming the limitations of the lack of methanol supply vessels by supplying fuel through tank terminals that regularly unload and store methanol.

The Minister of Oceans and Fisheries or the mayor/governor of a city/province may relax the standards for facilities in the relevant industry in any of the following cases:  
When fuel or water supply facilities installed at a port are used to supply fuel or fresh water to ships berthed at the port.

■ 해양수산부령 제 2022-11-13 "항만운송관련시설의 등록 및 신고의 기준" 제10조 관련

구분	1등급	2등급	3등급
	(부산항, 인천항, 울산항, 포항, 울산항, 양양항)	(여수항, 마산항, 울산항, 부산항, 양양항)	(1등급과 2등급을 제외한 항)
등록 기준	가. 각종 시설, 다. 다음 중 어느 하나 이상에 정비	1등급 이상	3등급 이상
	1) 연료공급선	용량수 100톤 이상	용량수 50톤 이상
			용량수 10톤 이상
	탱크 용량 30킬로리터 이상	탱크 용량 20킬로리터 이상	탱크 용량 5킬로리터 이상

# Lack of domestic methanol handling marine fuel suppliers(ships) and safety procedures

the second difficulty lack of domestic methanol handling marine fuel suppliers(ships) and safety procedures

## Establishing a foundation for realizing STS (Ship-to-Ship) fuel supply by securing methanol fuel supply vessels through the revision of the domestic shipping notification by the Ministry of Oceans and Fisheries

### Revision of regulations on securing methanol fuel supply vessels (Ministry of Oceans and Fisheries)

#### 1. 개정 이유

친환경 선박연료 공급망 구축을 뒷받침하기 위해 선박연료공급업의 장비로 등록된 500톤 이상 케미컬수송선과 식유제품 및 케미컬점용선에 대해 내항화물운송 목적으로도 해상운송 점업을 허용하여 메탄올 추진선박의 연료공급을 원활히 하고자 함.

#### 2. 주요내용

케미컬운반선 등의 내항화물운송업 및 선박연료공급업 점업 허용  
(안 제4조제3항 후단개정, 제7항 신설)

#### Proposal for Revision of Domestic Maritime and Port Notice for Activation of Methanol Bunkering

- ◇ 메탄올 추진선 발주(21-)·운항(23-) 확대에 따른 국내 메탄올 병커링(시운전선 등) 초기 수요(~30) 대응을 위해 「내항해운고시」 개정\*을 건의
  - \* 「해운법 시행규칙에 따라 정하는 내항해운에 관한 고시」(해양수산부 고시)
  - \*\* 내항화물선(케미컬선)의 메탄올 병커링 점업 허용 + 중유 LNG 대비 허용기준(중톤수) 완화

- (허용대상) 선박연료공급과 연안운송을 함께 허용하는 선박연료의 범위에 메탄올이 포함되어 있지 않음(식유제품 및 LNG만 허용 중) 원칙적으로 내항화물선이 메탄올 연안운송과 병커링 사업을 동시 수행 불가

\* 선박연료공급업과 내항화물운송업 업무를 위해 선박연료공급과 연안운송의 동시 수행 허용 대상은 선박연료로 한정된 것이며, 메탄올은 신규연료이기에 전단 기준 신설(20.11) 시 선박연료로 미명시

- (허용기준) 아울러 메탄올을 상단 허용대상에 포함해도 메탄올 선박연료 초기 수요\* 감안할 때, 기존연료(식유류 등)의 허용기준(중톤수 15백톤↑ 선박)을 메탄올 병커링에 그대로 적용 시 비효율(비용 과다) 발생\*\*

\* 메탄올 추진선 운항 본격화(30~) 전까지 국내에서는 조선소 시운전 공급이 주로 이루어질 전망으로, 해당 병커링 수요(1천톤 이하)에 적합한 내항선의 중톤수는 약 5백톤(적재량 1천톤) 내외

\*\* 적정규모(중톤수 5백톤 내외) 대비 초과 규모 선박(중톤수 15백톤 이상) 사용에 따른 불필요한 운신료 발생 + 적재톤수 대비 공선 운항 불가피운임 손실에 따른 기존 초과 규모 선박의 병커링 운항 기피 등(별첨 2 참조)

Bunkering of inland cargo ships is permitted through revision of the Inner Port Shipping Notification.

Chemical cargo ships can carry out methanol coastal transportation and bunkering business simultaneously



# Absence of methanol bunkering verification for domestic and foreign container ships

**the third difficulty** Absence of methanol bunkering verification for domestic and foreign container ships

World's first methanol dual fuel propulsion 'container' ship scheduled to be delivered

**Absence of prior research and verification**

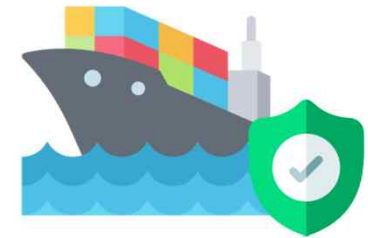


Ulsan Port Authority, Maersk(world's second largest shipping company), OTK(tank terminal) JC Chemical (domestic biodiesel producer) participates in the Ministry of Oceans and Fisheries demonstration project



Signing business agreements, holding seminars, operating TF, etc.

**All-out effort to implement methanol bunkering**








Eco-friendly marine fuel supply performance

**Securing success stories** such as safe work procedures

# Absence of methanol bunkering verification for domestic and foreign container ships

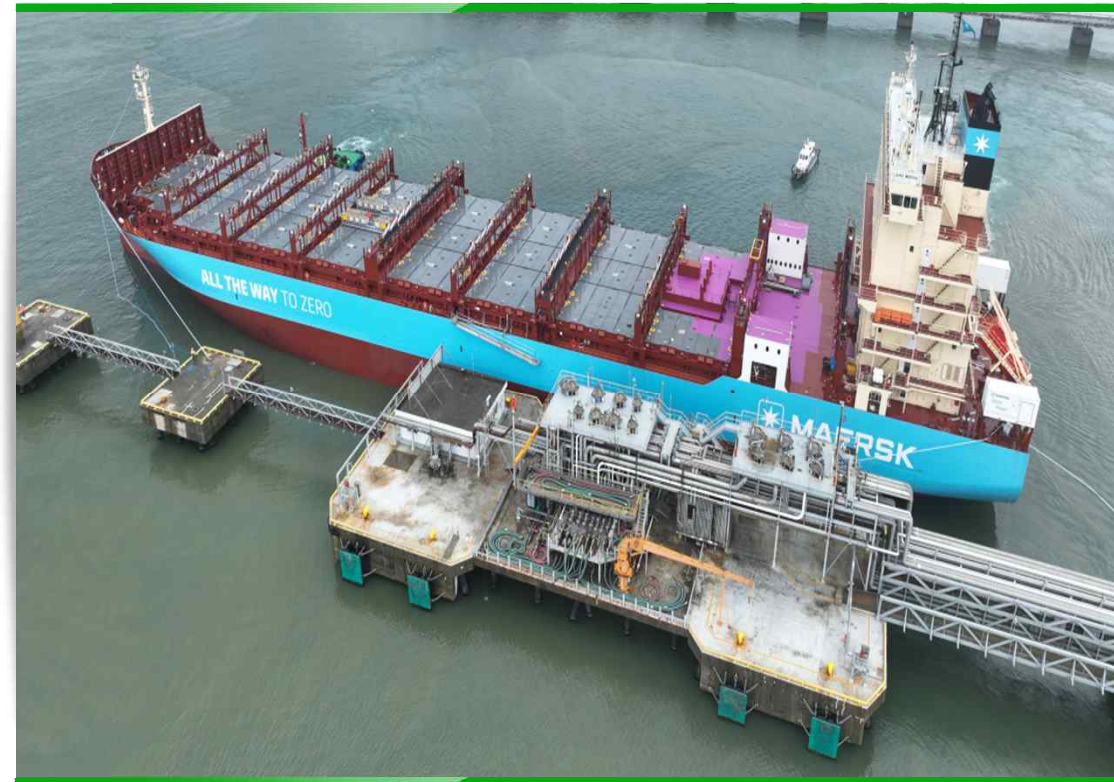
the third difficulty Absence of methanol bunkering verification for domestic and foreign container ships

## World's First Green Methanol PTS(Pipe/pier to Ship) Bunkering Successful for Container Ship

	Period	▶ July 2023
	Venue	▶ OTK Pier 1 at Ulsan Port
	Vessel Fuel	▶ Green Methanol 1,000 tons ▶ Biodiesel 1,250 tons
	Supplier	▶ OCI Global ▶ JC Chemical Co., Ltd.
	Receiving Vessel	▶ Laura Maersk / Container ship(2.1K)

### Cooperation between Ulsan Port and Korean Register

Conducted Ulsan Port methanol bunkering risk assessment and developed safety checklist











# Absence of methanol bunkering verification for domestic and foreign container ships

## The third difficulty

Absence of methanol bunkering verification for domestic and foreign container ships

## Successful Green Methanol STS(Ship to Ship) Bunkering for the World's first Ultra-large Container Ship

	Period	▶ February 2024
	Venue	▶ Ulsan Port Anchorage Area
	Vessel Fuel	▶ Green Methanol 3,000 tons
	Supplier	▶ OCI Global
	Receiving Vessel	▶ Ane Maersk / Container ship(16.2K)
	Bunker Ship	▶ Golden Sunny Hana / Chemical ship

### Cooperation between Ulsan Port and MOF

Establish standard working procedures for activating of methanol STS bunkering in Korean ports By 2024

Prepare guidelines that meet global shipping standards



# Absence of methanol bunkering verification for domestic and foreign container ships

## Third difficulty Absence of methanol bunkering verification for domestic and foreign container ships

### Report on supply of world's first green methanol container ship to Ulsan Port

**해양수산부 보도자료**  
 Next-generation eco-friendly ship fuel, green methanol, supplied to container ships for the first time in the world at Ulsan Port  
 Taking the first step in pioneering a new market for the export of eco-friendly ship fuel and port services

해양수산부(장관 조승환)는 7월 17일 울산항에서 세계 최초로 그린 메탄올 1천 톤 분이 컨테이너 선박에 성공적으로 공급되었다고 밝혔다.  
 \* 황산화물 100% 질소산화물 80% 및 탄소 저감 효과

이해당국은 국내 친환경 선박인 '항만 내 친환경 선박 연료 실증사업'을 통해 청정 에너지 및 항만시설 사용료 감면 등의 공익도 친환경 연료 공급을 위해 해운선사, 제조사, 선박연료공급업체 등과 함께 운영 법령과 행정절차 이행, 안전사고 예방조

**World's first methanol-powered container ship begins maiden voyage**  
 Maersk Solstice is heading to Europe after completing first bunkering in

Enhancing the status of Ulsan Port through overseas media reports

### Background and purpose of Korea-US green shipping route promotion

- ✓ As the world's fourth -largest shipping powerhouse based on fleet fleet, we are creating a new shipping industry through decarbonization and development of green industries and technologies (R&D).
- ✓ Shipping companies that have not built eco-friendly fleets are in fact at risk of being shut out , and shipping companies that have built ships are concerned about monopolies → Technology barriers that are advantageous to Korea are needed.

#### G20 Summit to Lead the Way in Building a Carbon-Neutral Ocean and Green Shipping Lanes

녹색기후기금에 3억달러...“개도국 운송가스 감축 돕는 ‘녹색사다리’”  
 “원자력발전과 수소에너지 중심으로 청정에너지 전환 주도”



### Dominate the market by up to 20 million tons by 2030 and up to 150 million tons by 2050.



- ✓ 2.4% of methanol in 2030  
18m tons/year
- ✓ 2.7% of methanol in 2030  
20m tons/year
- ✓ 8.5% of methanol in 2050  
63m tons/year



- ✓ Super-large ' Con ' vessel amid competition for fuel supply between Northeast Asian ports Fuel supply attraction

Attracting methanol supply to ultra-large container ships in January 2024



# Succeeded in supplying green methanol and biodiesel marine fuel for the first time in the world

Establishment of energy security and **creation of new energy industries and markets**

## World's first green methanol and biodiesel ship fuel supply

### Active administration



As marine fuel  
Biodiesel sales and tax exemption ,  
**First approval of methanol loading permit**



**Tank terminal ship fuel supply business**  
registration and risk assessment (verification)  
conducted,  
pushing for allowing domestic cargo transport  
companies to **register as ship fuel supply**  
**businesses under the Shipping Act.**



**Securing successful cases such as eco-friendly ship fuel supply performance and safe work procedures** through participation in joint demonstration projects with domestic and international companies.

### Results



#### environment

Carbon reduction effect of up to  
**95%** when using green methanol  
fuel

International Maritime Organization  
2050 International Shipping  
Driving the realization of carbon neutral  
policy



#### port

Ulsan Port, a global container port  
Container ships using Busan Port  
To a green methanol supply base  
Korea-U.S. Green Shipping Route  
Construction contribution



#### Related industries

- ✓ **methanol** Dominate the methanol marine fuel market with an annual capacity of 20 million tons by 2030  
- OCI, the world's largest green methanol producer, selected Ulsan Port as its bunkering base port.
- ✓ Expected to create economic effects by expanding **biodiesel** marine fuel manufacturing and exports (KRW 585 billion / year)
- ✓ Through attracting investment in expansion of methanol storage tank (KRW 150 billion)  
Expansion of methanol storage capacity (180,000 kl → 38kl)
- ✓ **Chosun Methanol** Contributing to the export of dual-fuel propulsion ships and the growth of the shipbuilding industry  
- Increase in orders for methanol-propelled container ships from domestic shipyards (9 ships in 2021 → 65 ships in July 2023)

**Securing growth engines for the port industry and revitalizing the private economy through innovation in eco-friendly marine fuel regulations**

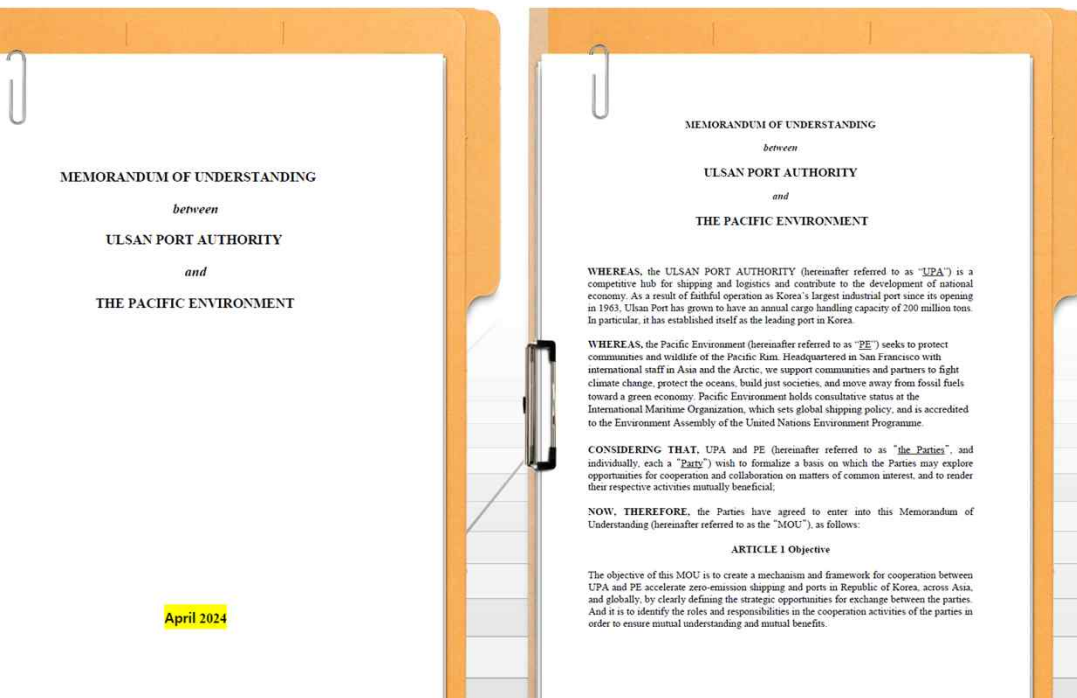
# Ulsan Port's efforts for climate energy

## Signed UPA-PE (Pacific Environment) MOU

Zero-emission shipping worldwide in response to climate change and Establishment of a cooperation system for port revitalization

## Establishment of Korea-US green shipping corridor

Realize carbon-free maritime transportation and Contribute to the development, distribution and diffusion of green fuels



### 대한민국과 미합중국 간 녹색해운항로 협력에 대한 공동 선언문

COP28 세계기후행동 정상회의에서 대한민국과 미국은 녹색해운항로에 대한 협력의 다음 단계를 발표합니다.

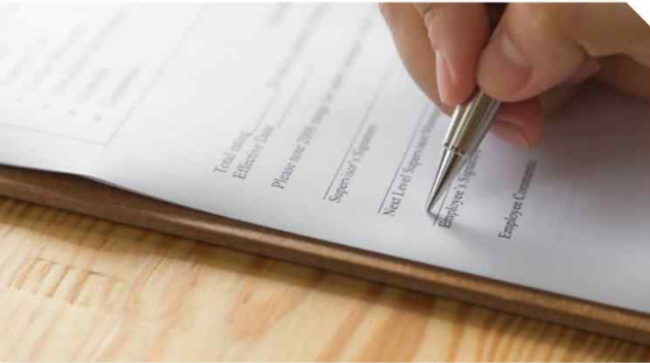
해운부문의 온실가스 배출량은 상당하며 현재 전 세계 배출량의 약 3%를 차지하고 있습니다. 이에 따라 COP27에서 해운부문 온실가스 배출 제로를 추진하고 지구 기온 상승을 섭씨 1.5도 이내로 제한한다는 목표에 부합하기 위해 녹색해운목표(Green Shipping Challenge)가 출범되었습니다.

이 목표의 일환으로 대한민국 정부, 미국 정부, 부산항, 미국 북서항만동맹은 녹색해운항로 구축을 위한 협력 의사를 밝혔고, 이를 계기로 대한민국과 미국은 머스크-맥케니-물러 무탄소선박센터(MMMCZS)를 통해 진행한 양국 간 사전 타당성 조사가 완료되었음을 알리게 되어 기쁘게 생각합니다.

Ulsan Port to become a bunkering port for the  
**Korea-US Green Shipping Corridor.**



# Ulsan Port's efforts for climate energy



**Green methanol, biodiesel  
Obtained marine fuel status**

**MISSION SUCCESS**



**Securing methanol fuel supply  
vessels through allowing  
bunkering sideline business**

**MISSION SUCCESS**



**UPA, shipping company (MAERSK), tank  
terminal (OTK), Collaboration with  
production company (JC chemical)  
Participation in eco-friendly fuel supply  
demonstration project**

**MISSION SUCCESS**

Ulsan Port supplies green methanol and biodiesel container ship fuel for the first time in the world!

**Contributing to carbon neutrality by supplying eco-friendly ship fuel in response to port energy conversion**



# Spread of global green methanol bunkering



World's first container ship award  
green Methanol PTS Ulsan Port bunkering success (23.7)



Successful green methanol STS bunkering for the world's first  
commercially very large (10,000 TEU or more) container ship (24.2)





# Thank You .

Climate energy field

