
MOL LNG Transport

GIIGNL 75th TSG Meeting

MOL FSRU Business / Technical Operations

29th May 2024, Groningen



Senior Manager, Marine Division.

Capt. Abbas Ali Mulji

LNGC / FSRU / Powership Services of MOL



MOL Introduction – Corporate Overview

Company Name
Mitsui O.S.K. Lines, Ltd.
(MOL)

Establish
1884

Revenue
USD 11.35 billion

Number of Group
Companies
509

Number of MOL Group
Employee
8,748

MOL Group Fleets
845 vessels
101 – LNGC, LNG to Power,
FSU/FSRU and LNGBV

(as of Mar 2023)

Market Position in LNG Shipping

LNG Carrier Business



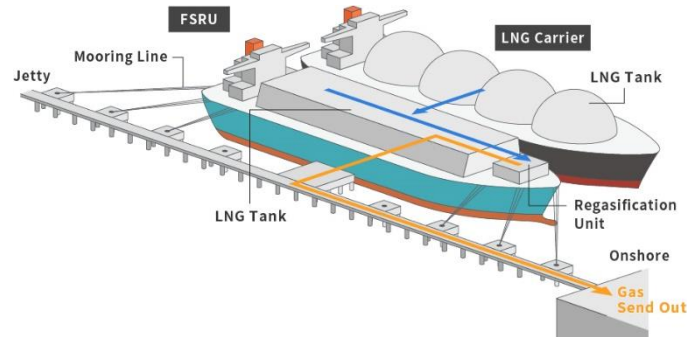
MOL's LNG Carriers

	In Operation	On Order	Total
Number of LNG Carriers MOL related	100	34	134
Number of LNG Carriers MOL involved in ship management	66	33	99
World Total	681	308	989

As of May 2023, including FSRU/FSU

FSRU Jetty solutions

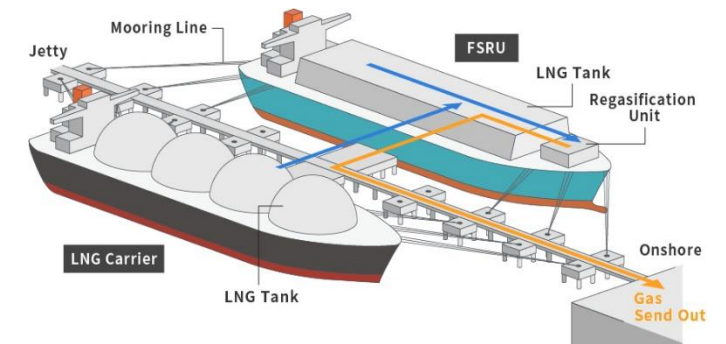
Double banking at
conventional tanker type jetty



Offshore cross-jetty with
subsea pipeline

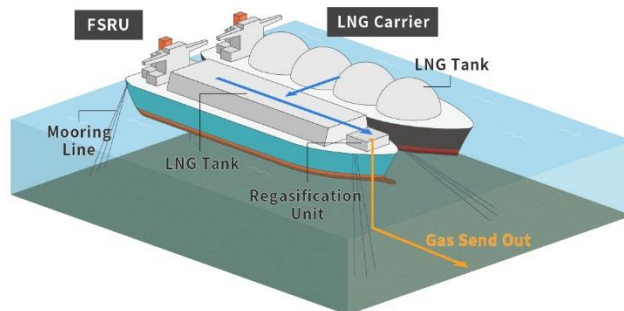


Conventional tanker type
cross-jetty mooring

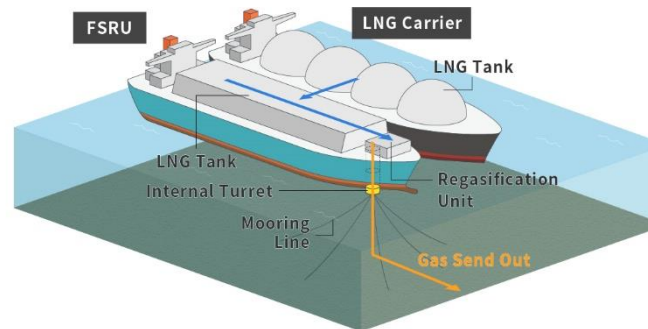


Standalone offshore FSRU mooring solutions

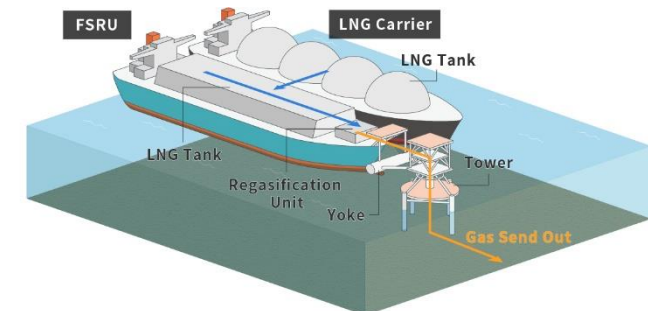
Offshore spread mooring



Offshore mooring to turret



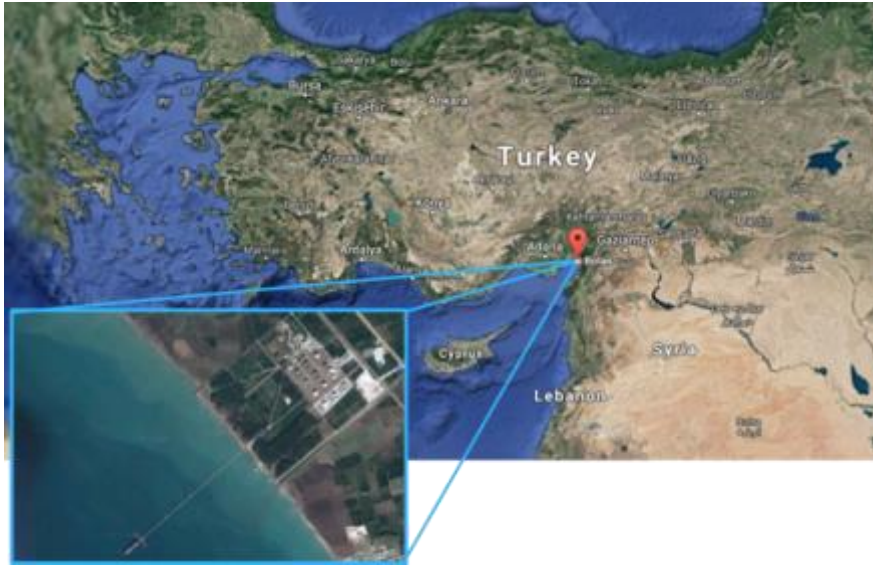
Offshore tower yoke mooring



Turkey Dortyol FSRU Project

- MOL 100% owned FSRU Bauhinia Spirit (ex. MOL FSRU Challenger) was engaged for an LNG receiving terminal in the South-East of Turkey.
- **Contract has been successfully completed in March 2021.**

<<Site Location / Dortyol, Turkey>>



<<STS Operation >>



FSRU Bauhinia Spirit (ex. MOL FSRU Challenger) (left) during STS Operation with LNG Carrier

Project Summary	Charterer	BOTAS (Turkish public oil & gas pipeline company)
	Site	Dortyol, Turkey
	Contract Period	Approximately 3.5 years
	Vessel	Bauhinia Spirit (ex. MOL FSRU Challenger)
	Commence of Operation	Nov 2017

Singapore LNG FSU Project

- FSRU Bauhinia Spirit (ex. MOL FSRU Challenger) also operated at SLNG terminal, was utilized as Floating Storage Unit (FSU).
- **MOL contributed to Singaporean energy security.**



<FSRU Bauhinia Spirit (ex. MOL FSRU Challenger)
in Keppel Shipyard>

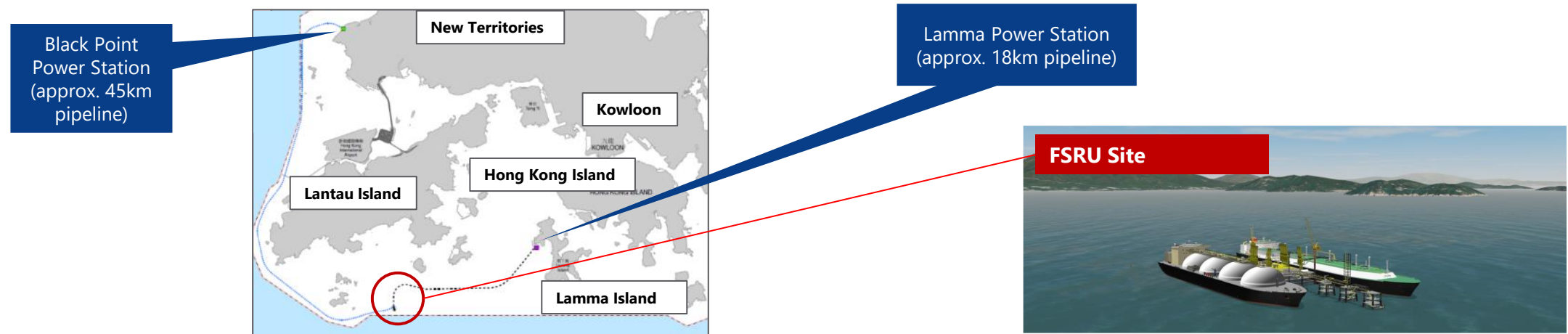
<SLNG Terminal>



(Obtained from SLNG website)

Hong Kong FSRU Project

- The first LNG import terminal in Hong Kong in support of Government's policy to reduce carbon intensity and increase the proportion of natural gas used for power generation.
- **MOL also undertake Jetty O & M Services and Port Services.**
- The regasified LNG at FSRU is distributed to two power plants, the Black Point Power Station and Lamma Power Station respectively.



Project Summary	Charterer	Hong Kong LNG Terminal Limited(*) (*)joint venture between Castle Peak Power Company Limited (joint venture between CLP Power Hong Kong Limited and China Southern Power Grid International (HK) Co., Limited.) and The Hongkong Electric Company, Limited
	Site	East of Soko Island, Hong Kong
	Contract Period	Long Term
	Vessel	Bauhinia Spirit (ex. MOL FSRU Challenger)
	Commence of Operation	2023

Turkey ETKI FSRU Project

The first floating LNG import terminal in Turkey in order to secure the gas supply especially during winter season.
Local private companies are leading this project and state-owned gas company BOTAS is offtaking regasified LNG.
Before this charter started, the modification work to install STS equipment was carried out at Marseille Shipyard in France.



Project Summary	Charterer	Engie/Total (Sub Charterer : Turkish conglomerate Kolin/Kalyon consortium)
	Site	Aliaga in Izmir, Turkey
	Charter Period	Approximately 3 years
	Vessel	Neptune
	Commence of Operation	Jan 2017

Indonesia Jawa-1 Project

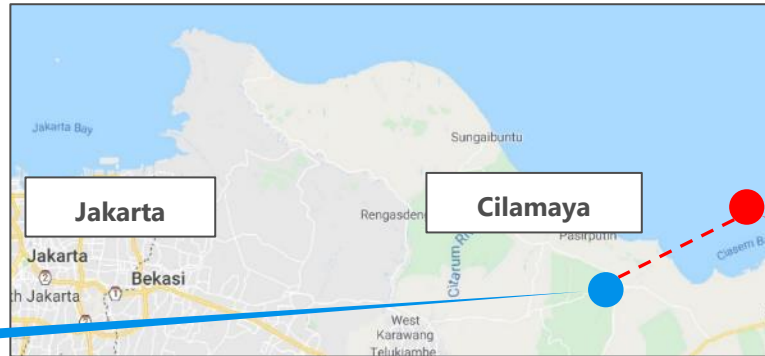
This is **Asia's first Gas-to-Power project using FSRU**. MOL provides **Technical Support for the Construction of New-built FSRU and O&M service for FSRU and invest in FSRU owner company**.

<Project Summary>

- The Gas fired power plant with a generating capacity of 1,760MW in Indonesia's West Jawa.
- FSRU will regasify LNG to supply fuel to the power plant, and the electricity produced by these facilities will be sold to Indonesian state-owned electricity company PT PLN (Persero).



Jawa-1 Power Plant

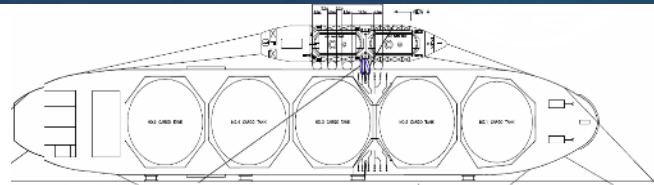


FSRU Project Site

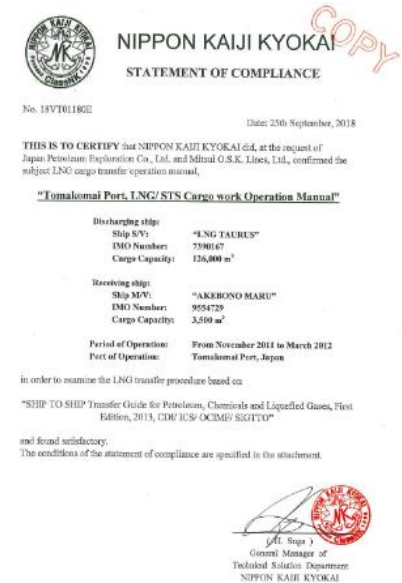
Project Summary	Charterer	PT Jawa Satu Power (IPP J/V owned by Pertamina, Marubeni and Sojitz)
	Site	West Java, Indonesia
	Contract Period	Long term
	Vessel	Jawa Satu (Storage Capacity: 170,000m3 / Delivery at shipyard : 2020)
	Commence of Operation	2024

Tomakomai FSU Project

First commercial LNG STS operations in Japan. STS operations from FSU to small shuttle tanker were carried out in winter season in 2011 and 2012. The purpose of LNG STS was to supplement domestic gas supply until onshore LNG terminal become ready. **51 LNG transfers in total were successfully conducted at the north of Japan in winter. MOL obtained Class Certificate for LNG STS Operation Manuals for this project.**



Class Certificate



Project Summary

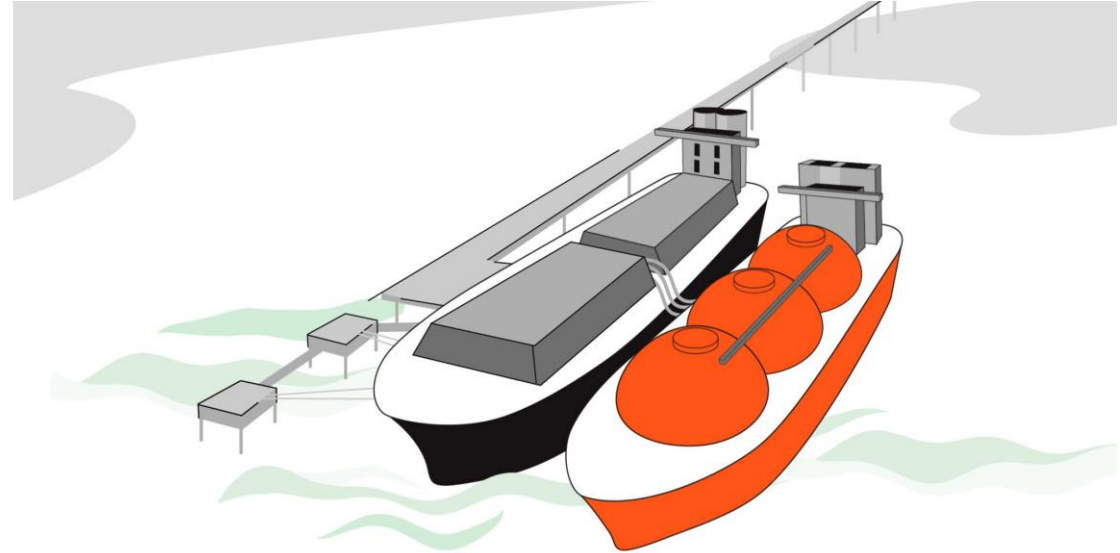
Charterer	JAPEX (Japan Petroleum Exploration Co., Ltd)
Site	Port of Tomakomai, in Japan
Charter Period	Winter season in 2011 and 2012
Vessel	LNG Taurus (FSU)

Poland FSRU Project

This is **Poland's first FSRU** and will contribute to the strategic strengthening of the country's energy security. MOL will own the FSRU and provide **construction supervision for the Construction of the New-built FSRU**. MOL will also manage the FSRU after delivery.



Courtesy of GAZ-SYSTEM

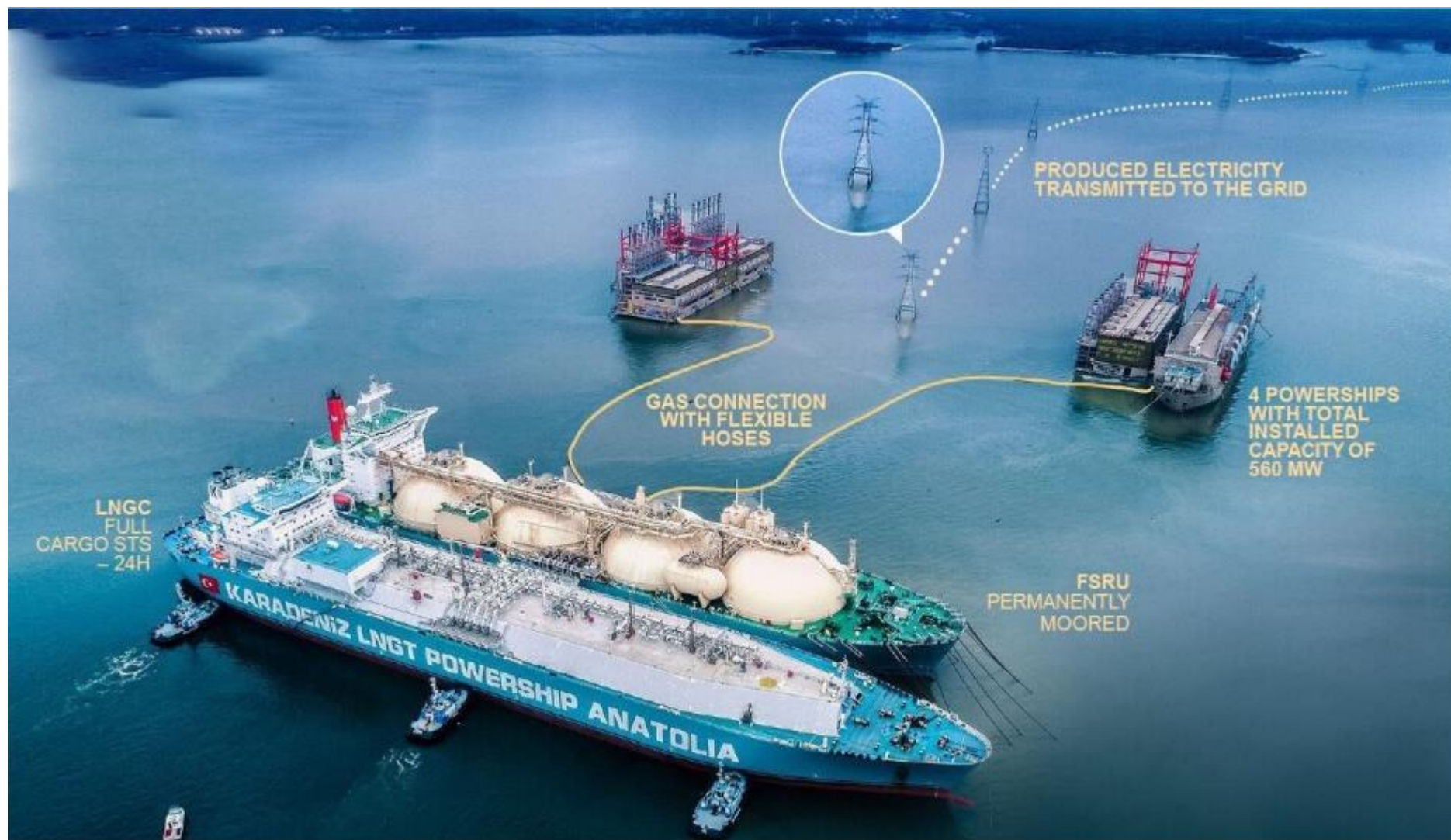


It is a strategic energy project for Poland

(Left: FSRU, right: LNG Carrier) Courtesy of GAZ-SYSTEM

Project Summary	Charterer	GAZ-SYSTEM S.A. (wholly owned by Polish State Treasury)
	Site	Gdańsk, Poland
	Contract Period	Long term
	Vessel	New Build FSRU, completed 2027
	Commence of Operation	2027 - 2028

LNG-to-Powership Service

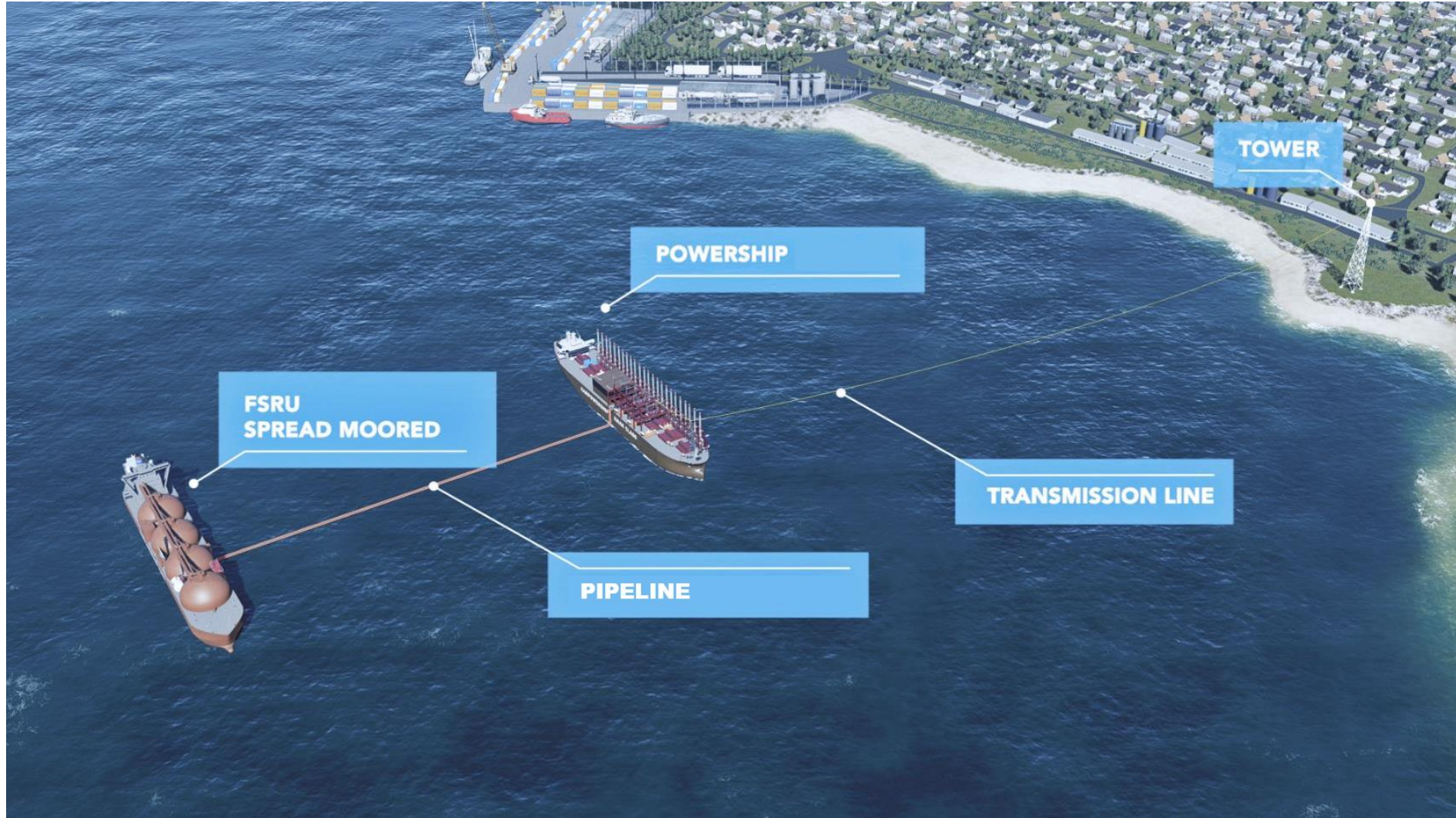


KARMOL LNGT POWERSHIP Asia Project

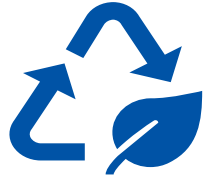


Project Sample – Schematic Model

KAR MOL



Various Mitsui O.S.K. Lines Group Initiatives



Environment

Wind Challenger Wind Hunter	LNG fueled/bunkering vessels	Clean Alternative Fuel	Northern Sea Route	LNG-to-Powership
Delta Sail Crane Rotor Sail	Offshore Wind Power Generation (Related Biz)	CCUS	Marine plastic waste	International initiative
e5 Fully Electric Vessel	Marine Renewable Energy	Mangrove Restoration/ Conservation Project	FSRU	



Marine
Consultation

Offshore Wind Power Generation	Maritime Training
Maritime Consulting	Global HR Consulting Service (Recruitment & Training)



Digitalization

Lighthouse	FOCUS Project
Autonomous/ Safe Operations	Mathematical Optimization



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