



LNG Bunkering

A Path towards Sustainable Growth

Presentation

June 2023

The PETRONAS Group adopts zero tolerance against all forms of bribery and corruption. All employees are to abide by the PETRONAS Code of Conduct and Business Ethics (CoBE) & Anti-Bribery and Corruption (ABC) Manual, guided by our Shared Values and Statement of Purpose

© 2022 Petroliaam Nasional Berhad (PETRONAS)

All rights reserved. No part of this document may be reproduced in any form possible, stored in a retrieval system, transmitted and/or disseminated in any form or by any means (digital, mechanical, hard copy, recording or otherwise) without the permission of the copyright owner.

Content

1. LNG Bunkering	04
2. PETRONAS LNG Bunkering	05
3. LNG Bunkering Key Challenges	07
4. Next Steps	08

LNG Bunkering

LNG Bunkering – Land Based vs Marine Base Solutions

Requires various considerations

Target Market

Parcel size dictate delivery economics

Infrastructure

Cost and Time underline project viability

Traffic Access

Flexibility to reach delivery points

Logistic

Attractive offering requires competitive end to end cost

Ship to Ship

> 80 %



- For supply of more than 200 m³
- Target user(s): Commercial vessels

Terminal to Ship

< 15 %



- For supply of more than 100 m³
- Target user(s): OSVs, small commercial vessels & Ferries

Truck to Ship

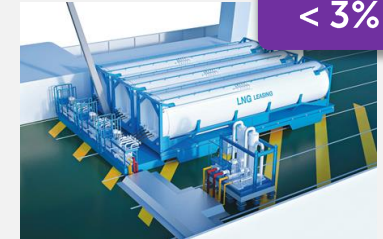
< 5 %



- For supply of up to 150 m³
- Target user(s): OSVs & coastal vessels

ISO Tank

< 3 %



- For supply in small parcel < 100 m³
- Target user(s): Coastal vessels, small boats & port services vessels

Legend:  Potential market throughput

PETRONAS LNG Bunkering

Positioning Malaysia – Regional LNG Bunker Hub

Re-Gas Terminal Sungai Udang



Re-Gas Terminal Pengerang



LNG Bunkering Vessel



Transforming South East Asia Green Gateway

Key Success Factors:

- Utilization of existing facilities to expedite operationalization (RGT-Sungai Udang & RGT Pengerang)
- Identification of main bunkering activities / Delivery mode (STS Bunkering via bunkering vessel – Avenir Advantage)
- Recognition of key target market and demand center (Commercial ocean-going vessels & Strait of Malacca)

Achievements in LNG Bunkering



Successful Commissioning
of LBV & reloading facility
at RGTSU



STS LNG bunkering
operation with Siem Aristotle
at Pasir Gudang port



Delivery to Seri Bijaksana for
its Heel & Tank Conditioning.
Volume in LBV depleted and
due for recharge



STS LNG bunkering
operation for an Aframax
tanker – Altera Wave



STS LNG bunkering operation
for a Cape-size bulk carrier
- HL Green



STS LNG bunkering Product /
Chemical Tanker
- Fure Vinga



STS LNG bunkering repeat
bunkering
- HL Green



STS LNG bunkering
operation for Altera
Wind (sister to Altera
Wave)

LNG Bunkering Key Challenges

LNG Bunkering Key Challenges

Key Challenges



Infancy phase of market development

- Near zero market development outside Northwest Europe (NEW) and Northeast America (NEA)
- Away from existing market of NWE & NE America;
- Limited infra-structure developments



Price Competitiveness Against Conventional Fuels

- Fluctuation in the oil market
- Multi-layered price structure
- Market creation phase



Security of Supply and Ability to Supply

- Security of correct quality of Molecule
- Ability to make supply to meet market demand (multi-nodes)
- Providing assurance on security of supply-ability

“For ship owners, fuel producers, and engine manufacturer, economic criteria, in particular fuel price are the most importance. These group rank LNG and HFO are the highest, followed by fossil methanol, and then various bio-fuels”
Extracts from a research paper on Alternative Marine fuel (2019) of Swedish stakeholder

LNG Bunkering – Price Attractiveness

Addressing the Key Challenges



Price Competitiveness Against Conventional Fuels

- Marked against primary fuel product in the bunker market
- Multi-layered price structure
- Market creation phase – promotion / incentives

Competitive Offers

- Bunker Market based price offering.
- Flexible delivery means to meet the various delivery requirement
- Comprehensive offering & services inclusive of Tank Conditioning services
- Global reach with access to main ports and routes
- Provide stable and security of supply
- Development of strong branding with reliable track record and good reputation.

Product Quality

- Stable product quality
- Reliable, flexible and quality services

LNG Bunkering – Infrastructure Development

Addressing the Key Challenges



Security of Supply and Ability to Supply

- Security of adequate quantity & correct quality of Molecule supply
- Ability to make supply to meet market demand
- Providing assurance on security of supply-ability

LNG Supply & Supply Network

- Ensuring sufficient supply and correct quality of supply
- Easy reach to correct source of product
- Development of supply network with global reach to ensure supply–ability in all major ports and trades routes
- Strong branding with reliable track record and good reputation

LNG Bunkering Infra-structures

- LBV offers the flexibility in ability to supply LNG Bunker via Ship-to-Ship transfer at the customer's convenient locations
- Truck Loading offers supply for small size parcels and remote access
- Strategic Storage capacities and location provide quick access to market

Moving Forward



Development of LNG Bunker Market & Friendlier Eco System

Sustainability

Collaboration

Greener Future



PETRONAS

Passionate about Progress