



# Development of CO<sub>2</sub> Crossborder Transport for Malaysia CCS Hub

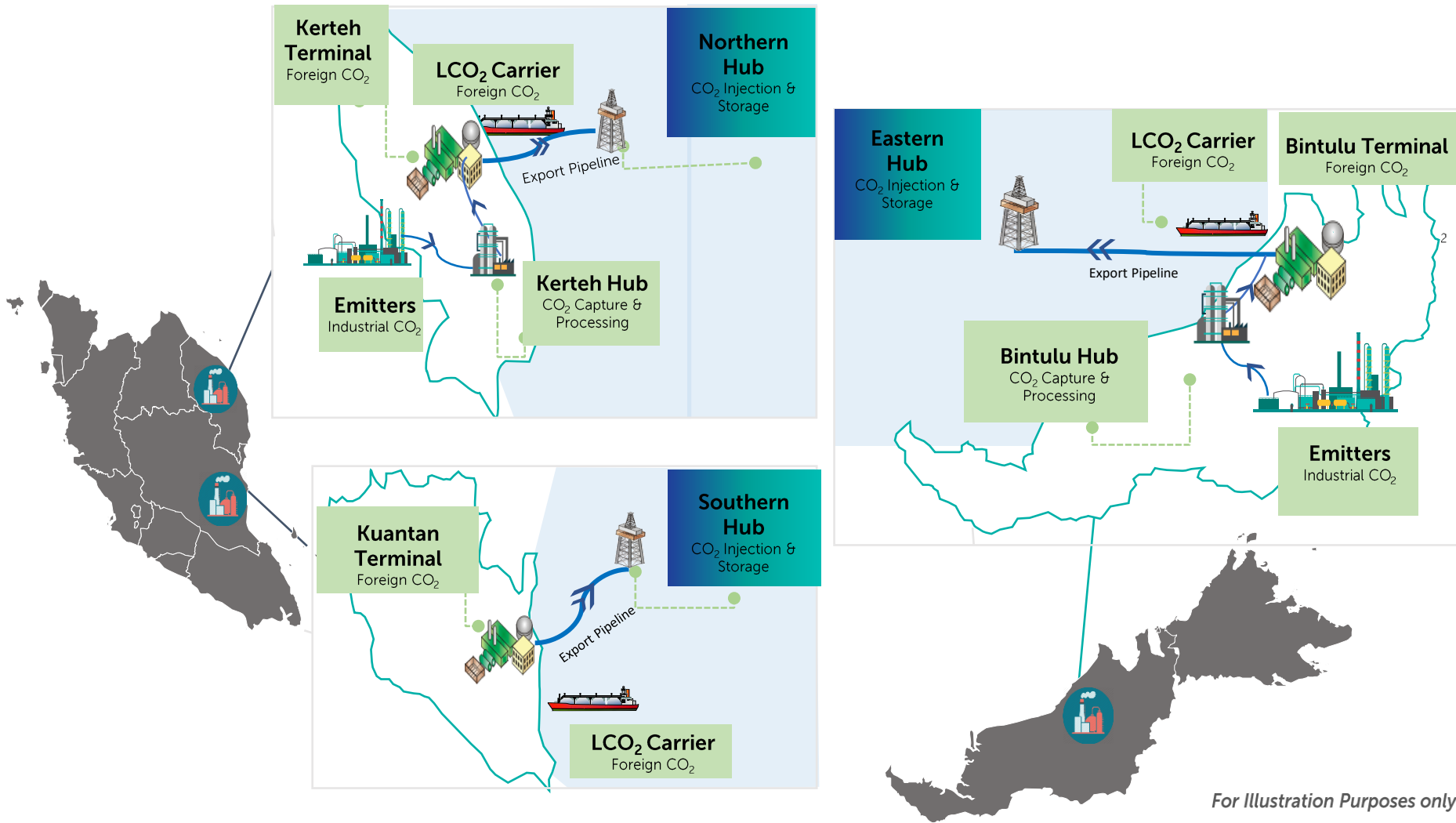
08.02.2024

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# PETRONAS progressing rapidly to mature CCS Hub development for Malaysia towards PETRONAS Sustainability Agenda & Regional Decarbonization effort



## Short & Long Haul LCO<sub>2</sub> Carrier

STATEMENT OF APPROVAL IN PRINCIPLE

PETROLIUM NASIONAL BERHAD (PETRONAS)

PETROCC S.S. (JV), (100%)

SHANGHAI MARITIME GROUP RESEARCH INSTITUTE (SMRI)

15.000 CRYO-LCO<sub>2</sub> CARRIER

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15.000 CRYO-LCO<sub>2</sub> CARRIER

✓ **Completed Conceptual Design for 2 LCO<sub>2</sub> Carriers**

APPROVAL IN PRINCIPLE

ABS

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✓ **Designs obtained Approval in Principle (AIP) from DNV/ ABS**

✓ **Potential reduction of Unit Cost by 30% from existing design in market**

2022      2023      2024      2025 🚩      2026      2027      2028

- 2022: MoU Studies with Partners/ Customers
- 2023: Storage Technical Maturation and CCS Hub Studies & Engineering
- 2025: FID
- 2026: Execution of hub inclusive of Capture, Transportation and Storage
- 2028: 1<sup>ST</sup> INJECTION



# LCO<sub>2</sub> Carrier & Terminal Schedule

## Short & Long Haul LCO<sub>2</sub> Carrier

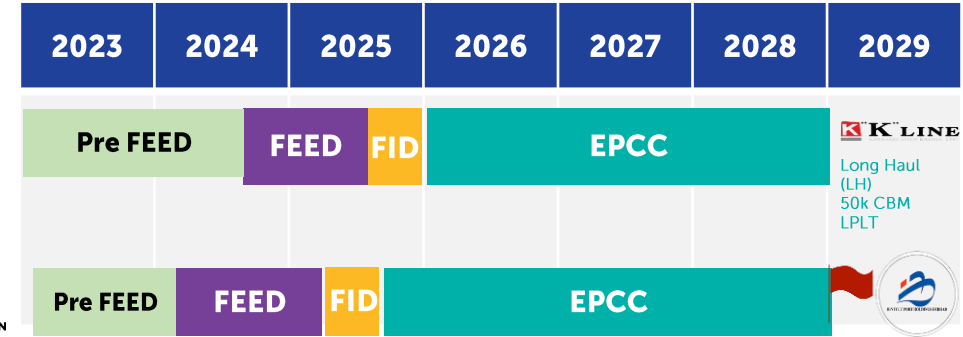
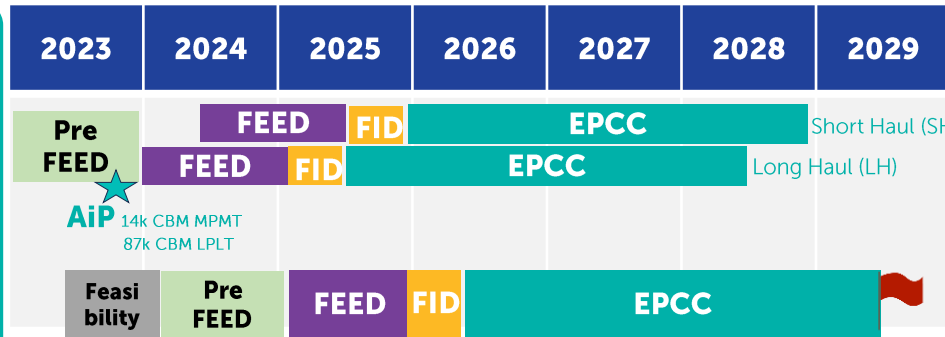


Completed Conceptual Design for 2 LCO<sub>2</sub> Carriers

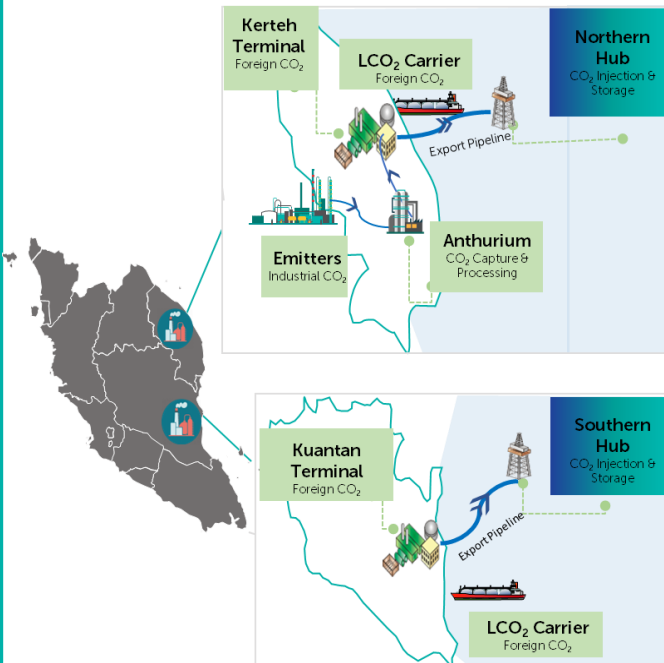


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Potential reduction of Unit Cost by 30% from existing design in market

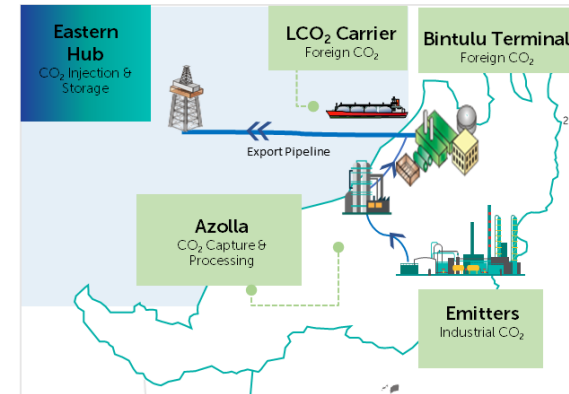


Long Haul (LH) 50k CBM LPLT



LCO<sub>2</sub> Carrier (SH) FEL 3  
Kerteh Terminal FEL 2

LCO<sub>2</sub> Carrier (LH) FEL 3  
Kuantan Terminal FEL 1



LCO<sub>2</sub> Carrier (SH & LH) FEL 2  
Bintulu Terminal FEL 2



For Illustration Purposes only

# Clarity on the following elements are critical to enable the CO2 crossborder transport for CCS purposes



**London Convention ratification requirement**



**Carbon Accounting/Validation**



**CO2 Ownership**



**Fit for Purpose Design Standardization Competitiveness**



**Carbon liability boundary agreement between value chain**



**Safety & Risk Management**

## Cross Border CO<sub>2</sub> Transportation

**Malaysia's non-ratification to the London Protocol is not an obstacle to CO<sub>2</sub> cross border transport. Bilateral arrangement between Malaysia and the identified exporting countries provide the avenue to allow CO<sub>2</sub> to be transported at sea and across borders.**

As sovereign States, countries may enter into contractual arrangements among themselves to allow cross border transportation of CO<sub>2</sub> and to conduct themselves in line with the London Protocol (if the country is not an existing Party to the LP).



The **Provisional Application** addresses the cross-border transportation of CO<sub>2</sub>, allowing it to be transported and stored between countries that are Contracting Parties, **and Contracting Parties and Non-contracting Parties.**



Establishment of **bilateral arrangement for cross border CO<sub>2</sub> transportation** from identified countries in the region (i.e., Japan, South Korea, Singapore and Taiwan) for permanent storage in Malaysia.



**Study on B2B Elements**



**MoC between Petronas – Japan (METI & JOGMEC)**



**PETRONAS**



**50**  
**YEARS**