

Proposal to HKSARG

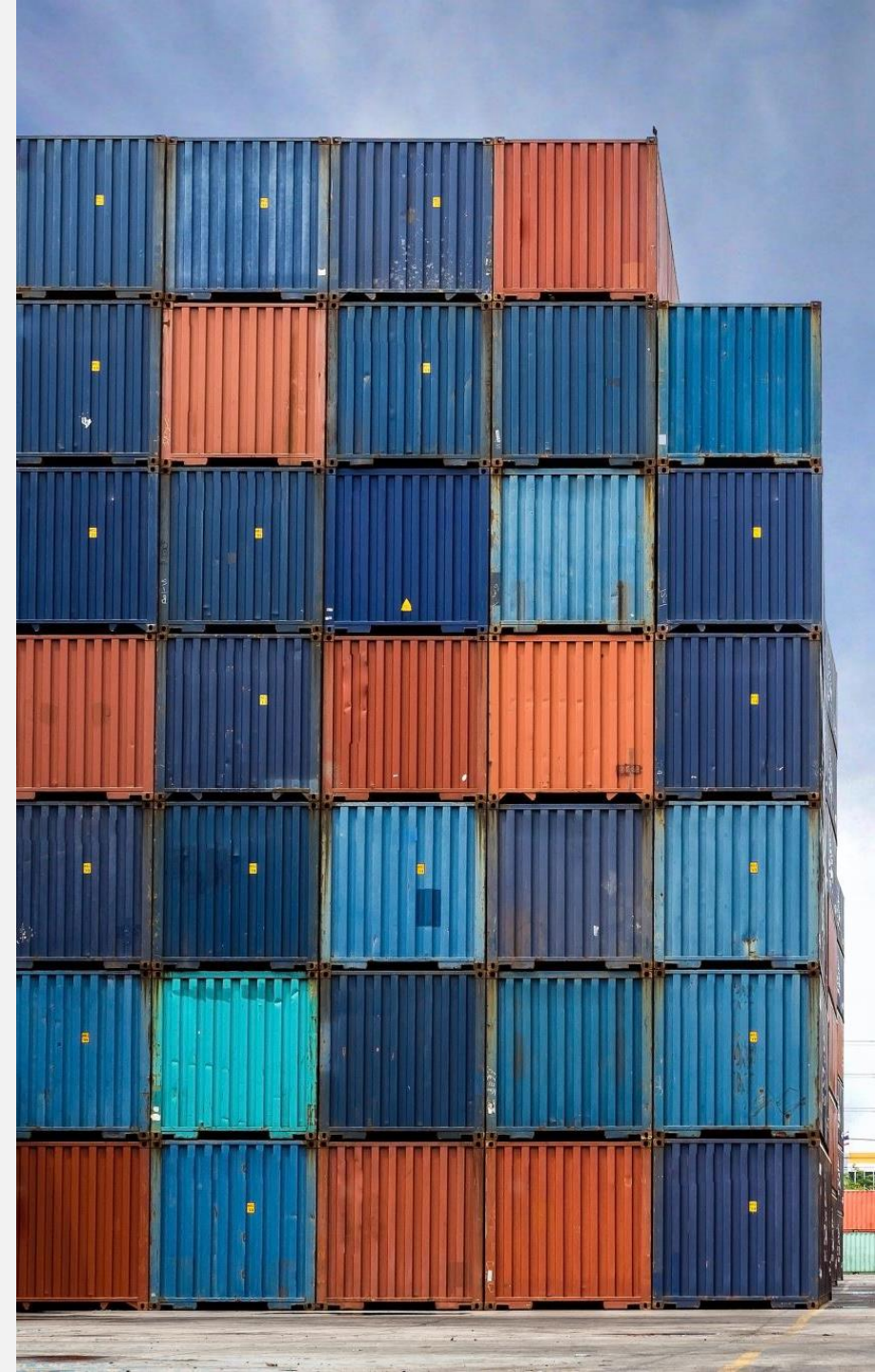
Expanding the Action Plan of Green Maritime Fuel Bunkering and Trading



22 November 2024

Background

- Development in green maritime fuels evokes memories of containerisation in 1950s/ 1960s, both call for Pioneers.
- China's growing green methanol production capacity and proximity to Hong Kong (HK): opportunity for HK
- 2023-24 Policy Addresses
- Development of this Proposal
 - **February 2024** – start engaging maritime stakeholders
 - **3 June** – First meeting of Advisory Panel on OGV
 - **22 October** – Green Methanol OGV Workshop
 - **22 November** – Issuance of this Proposal



Components of Proposal for Action Plan

Confine green fuels to Green Methanol (GM)

- A. Strengthening HK as a Bunker Port
- B. Supply, Price & Certification
- C. Infrastructure readiness
- D. Demand of GM
- E. Roadmap
- F. HKUST's messages to maritime stakeholders

A. Strengthening HK as a Bunker Port

- Import fuel oil from China¹
- Set target for GM bunkering²: 300 kT by 2030³
- Promote mass flow meters with a view of future legislation

1. HK declined from 4th in 2020-1 to 7th in 2023 as bunkering port globally (~ 5MMT, about 10% Singapore - see **Screen 1**).
2. GM bunkering in [Shanghai](#), [Singapore](#), [Japan](#) and [South Korea](#).
3. the Lower Bound, see **Screen 2**.



2023 “全球十大船加油港口” 排名结果

2023 Global Bunker Rankings By Port

2023全球十大船加油港口 (百万吨) 2023 Top-10 Bunker Ports (mn t)

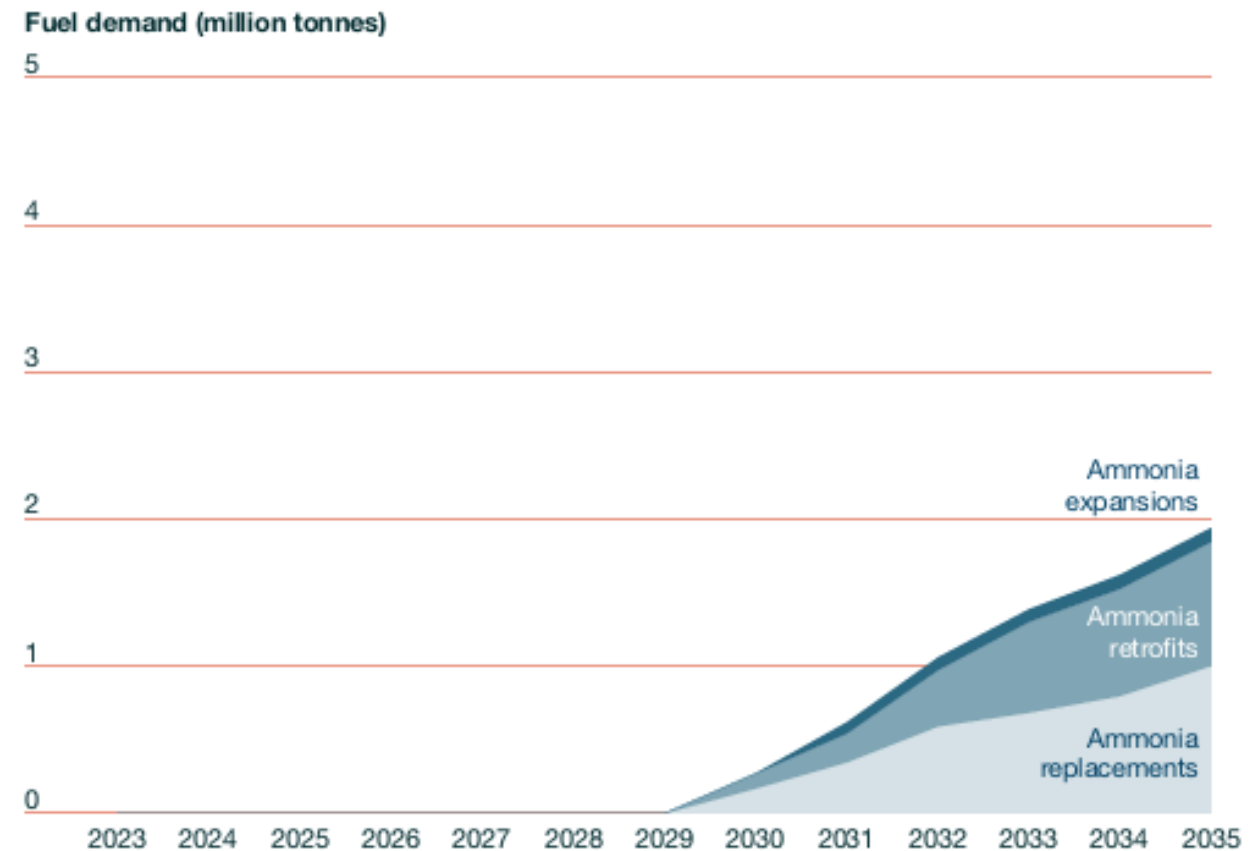
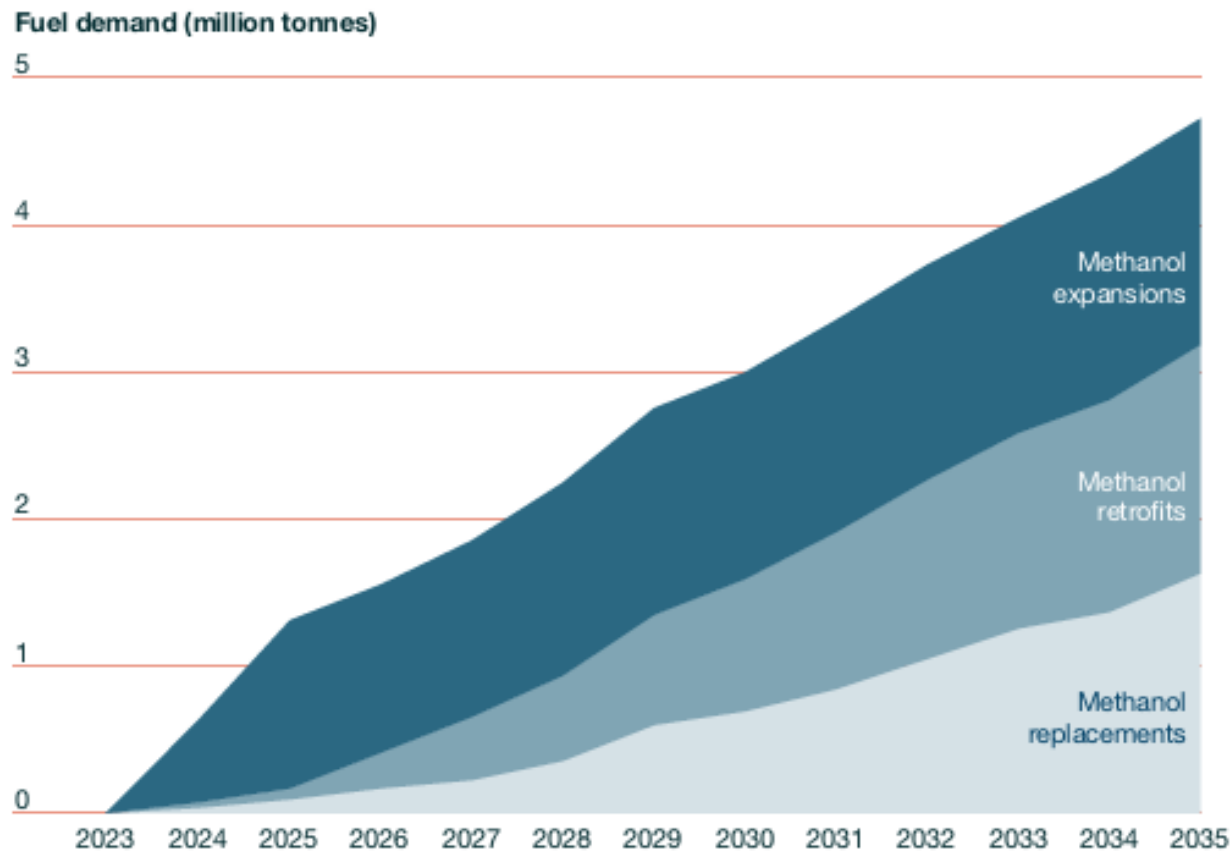
Rank	Country 国家	Port港口	2023 Volume总量
1	Singapore 新加坡	Singapore 新加坡	51.82
2	The Netherlands 荷兰	Rotterdam 鹿特丹	9.81
3	UAE 阿联酋	Fujairah 富查伊拉	7.48
4	China 中国	Zhoushan 舟山	7.04
5	Belgium 比利时	Antwerp-Burges 安特卫普-布鲁日	6.15
6	South Korea 韩国	Busan 釜山	5.78
7	China 中国	Hong Kong 香港	5.10
8	Panama 巴拿马	Panama 巴拿马	4.91
9	United Kingdom 英国	Gibraltar 直布罗陀	4.54
10	China 中国	Shanghai 上海	3.41

Figure 5 in “The Silk Alliance: A progress report”

Singapore 3.0 MMT in 2030 => **Estimated HK 0.3 MMT** (based on 10:1 ratio of Singapore: HK bunker demand, see screen 1)

Figure 5

Projected growth of alternative fuel demand for the Silk Alliance baseline fleet to 2035



Source: <https://www.lr.org/en/knowledge/research-reports/2023/silk-alliance-progress-report/>

B. Supply, Price & Certification

- **Supply:** Collaborate with GBA authorities for GM deliveries⁴
- **Price:** Ditto, to establish common incentives and carbon levy, aim to reduce the price gap in 2026⁵.
- **Certification:** reliable green fuel supply chain services, e.g. verified fuel quality, measurements and integrity certification, leveraging blockchain of immutable record chain.

4: GM Supply: HK close to CIMC and Towngas bio-methanol plants in Guangdong ready by end 2025 and 2026;

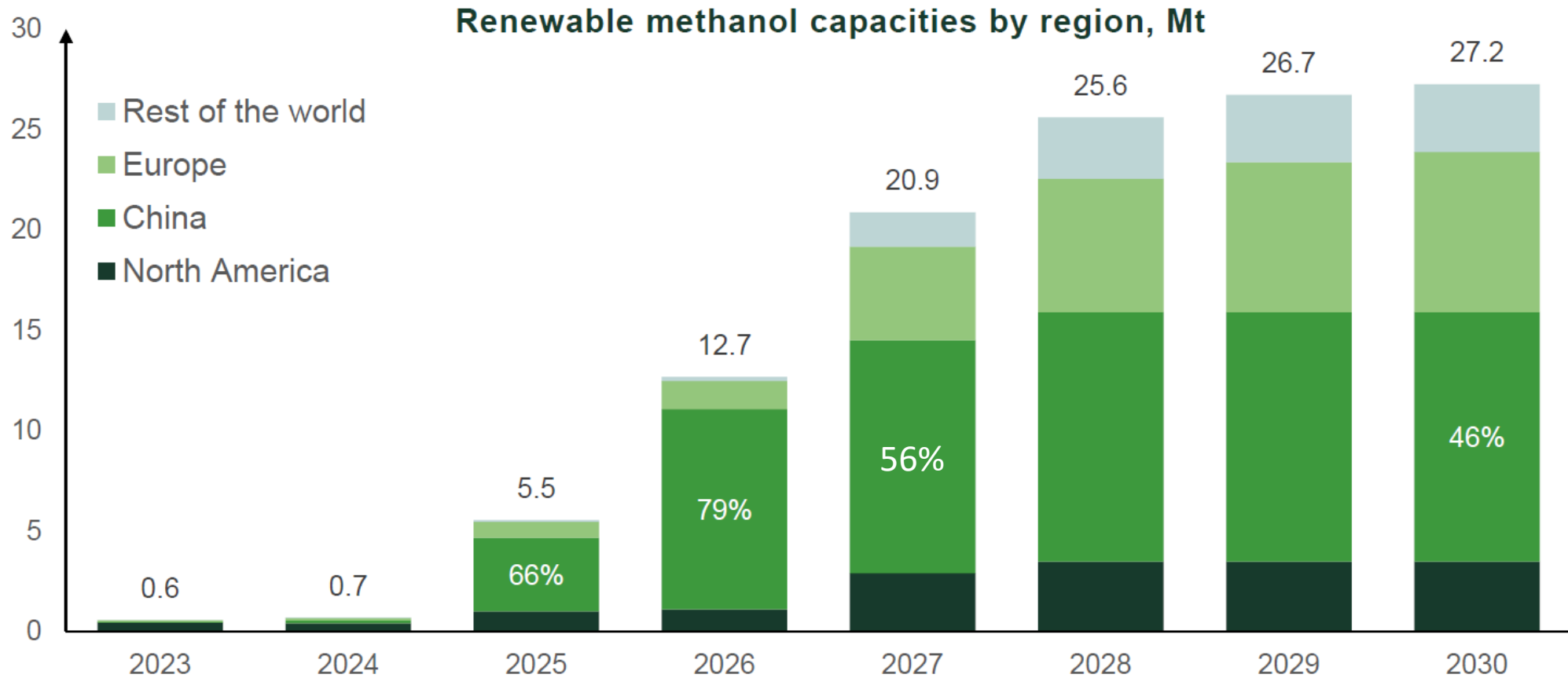
See **Screen 3**: China takes lead in years 2026 (79%) and 2027 (56%).

5: GM price: about 2.5 times (see **Screen 4**) conventional fuel on FOE initially.

Production Lead 产能领先者

China takes lead in the renewable methanol development in the min-term perspective
中国在可再生甲醇开发上在中期领先

Screen 3



Incentivizing low-carbon methanol production.

We expect government policies and regulations to lead to increased investment and demand for low and zero carbon methanol. Greater production of lower or zero carbon methanol can be incentivized through various means including customers' willingness to pay a higher price and new technology that reduce production costs.

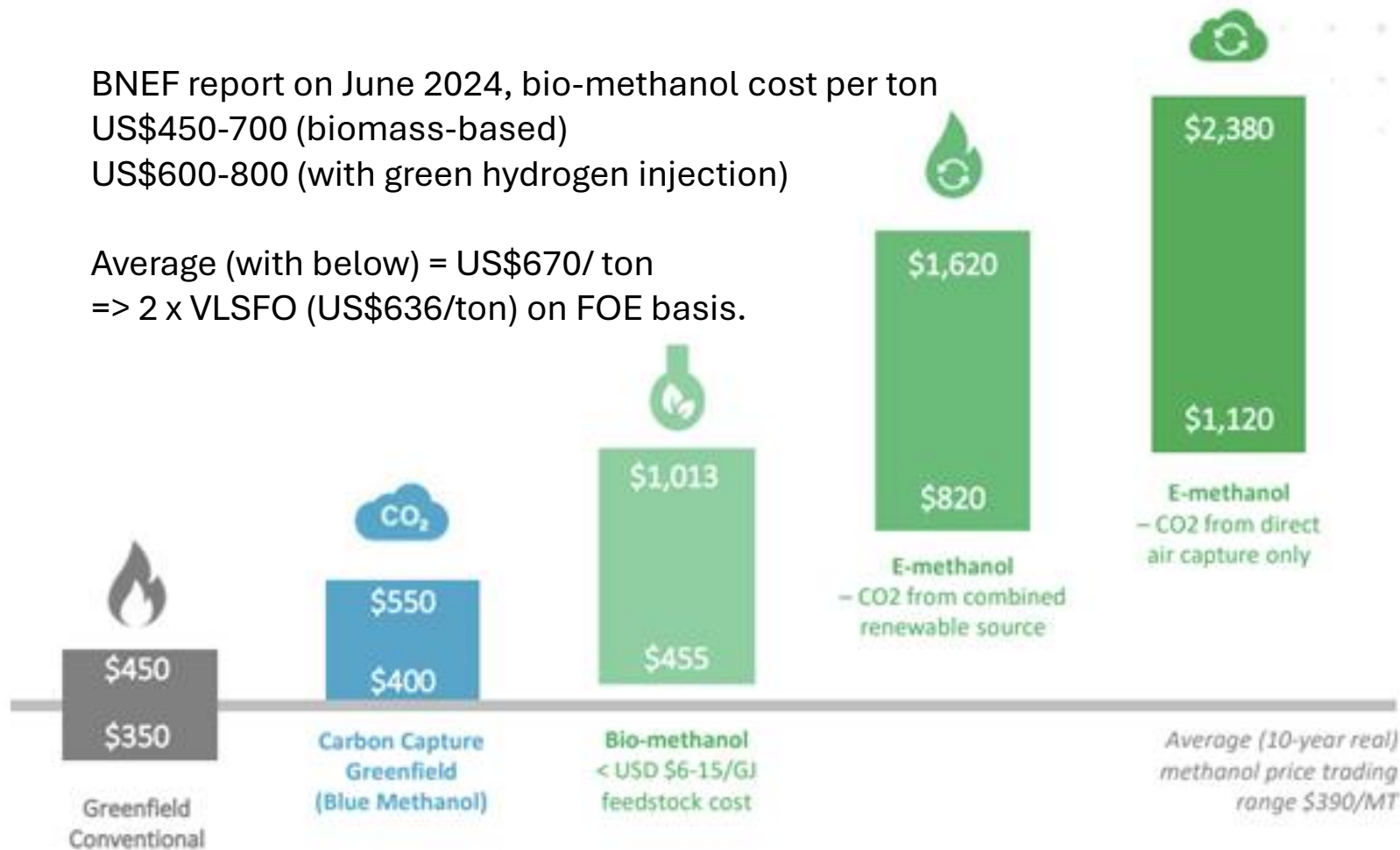
The cost for lower emission methanol is expected to decrease as technologies mature and become scalable.

Range of current capital and production costs for different forms of methanol

USD \$/tonne of methanol*

BNEF report on June 2024, bio-methanol cost per ton
 US\$450-700 (biomass-based)
 US\$600-800 (with green hydrogen injection)

Average (with below) = US\$670/ ton
 => 2 x VLSFO (US\$636/ton) on FOE basis.



Source: 2021 Irena Report and internal estimates. * Exchange rate used USD 1 = EUR 0.9

C. Infrastructure Readiness – Shore Tank

- Make available GM tank capacities from 2026/27 to 2050, see **Screen 5**.
- Explore financial feasibility/ business model with oil terminal operators.
- Accelerate transition by incentives and support of regulatory compliance initially.
- Mandate a certain capacity or percentage for GM upon land lease renewal.

GM tank capacities from 2026/27 to 2050

Start year	Tank capacity (m3)	Remarks – only bunkering demand
2026/27	6K – 15K	= (4000+2000)m3/week x (2.5 weeks)
Containership demand is the largest; GM bunker volume = 4K m3 (one big containership) + 2K m3 (one small containership)/ week		
2030	18,000 - 45,000#	= 7.5% x 5M x 2/ 52 x 2.5/ 0.8
IMO target 5-10 %; HK Fuel Oil bunker demand = 5 MMT/year (see screen 1); Conversion factor = 2 (HFO => GM); Density = 0.8 t/T/m3		
2040	113,000	= mean of 2030 and 2050
30% demand (mean of MAN and ABS fuel mix estimate by 2050)		
2050	182,000	= 4 x Year 2030 demand

Lower/ Upper bounds refer to Silk Alliance estimate/ IMO mean target 7.5%, 0.3 and 0.75 MMT (screen 2/ 1).

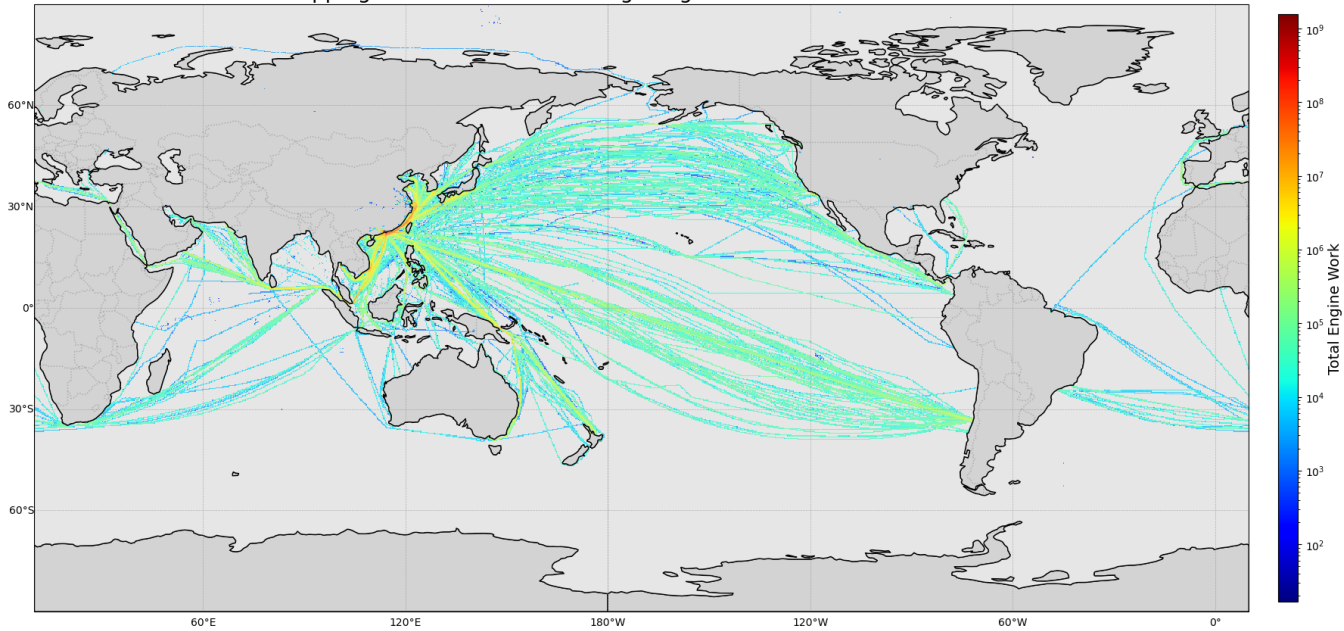
C. Infrastructure Readiness

- Bunker Barges
 - Secure moors/ rezone the anchorages.
 - Assist to obtain local licence and support financially.
 - Streamline assessment.
 - Address Labour Shortage: mutual recognition of crew and bunker barges with GBA authorities.
- Crew and Onshore Training
- Bunkering Standards

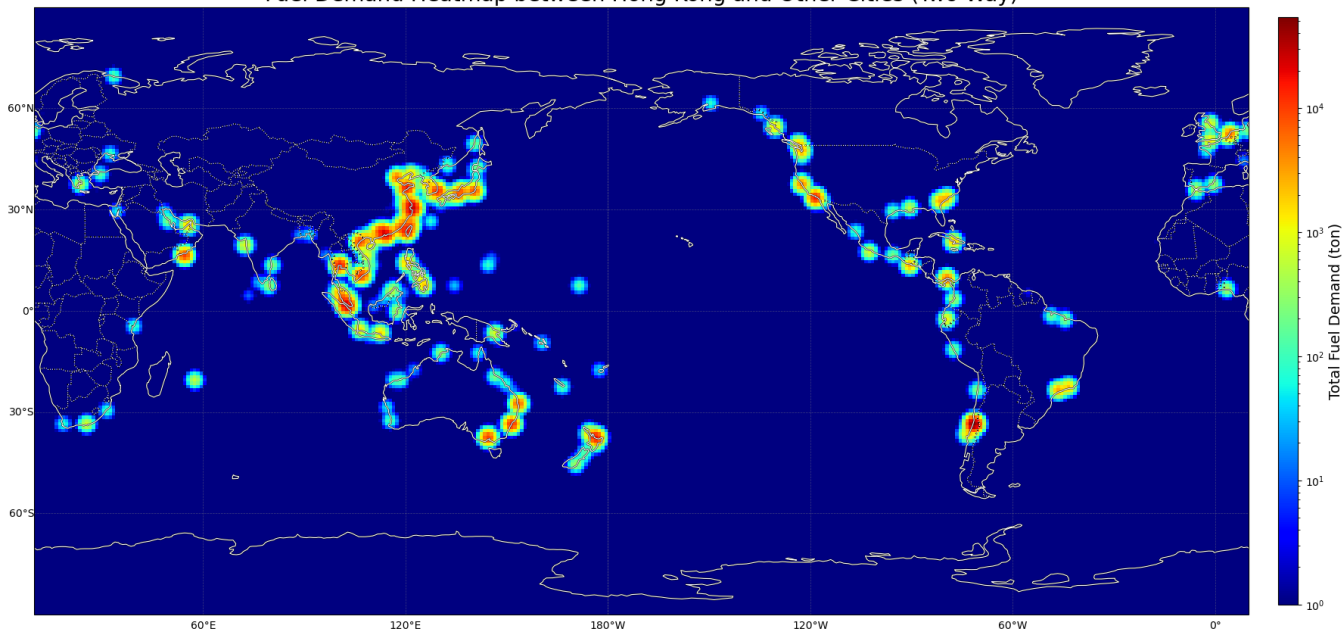
D. Demand

- Duty exemption.
- Green shipping corridors (see **Screen 6**).
 - small container feeders for China coastal/ intra-Asia routes
 - large containerships for Oceania/ Latin America routes
- Export Demand Potential: Korean tankers importing CPP to backhaul GM
- Address Expectation Gaps: EoI for demand aggregation.
- Adopt innovative compliance model, e.g. “book-and-claim” platform.

Shipping Activities between Hong Kong and Other Cities in the World



Fuel Demand Heatmap between Hong Kong and Other Cities (Two-Way)



Routes Name (Two-Way except Chile)	Country	Total Voyage Counts	Total Ship Counts	Total Voyage Days	Estimated Fuel Demand (ton)
San Antonio	Chile	52	29	23.3	243,725
Singapore	Singapore	1091	489	4.9	157,883
Tauranga	New Zealand	58	33	13.0	102,845
Laem Chabang	Thailand	907	192	4.5	100,968
Ningbo	China	484	267	3.9	98,663
Qingdao	China	443	202	4.3	98,511
Kaohsiung	Taiwan, China	2075	508	1.6	97,693
Shanghai	China	863	308	3.7	97,247
Valparaiso	Chile	20	13	22.9	93,506
Sydney	Australia	63	19	13.0	87,943

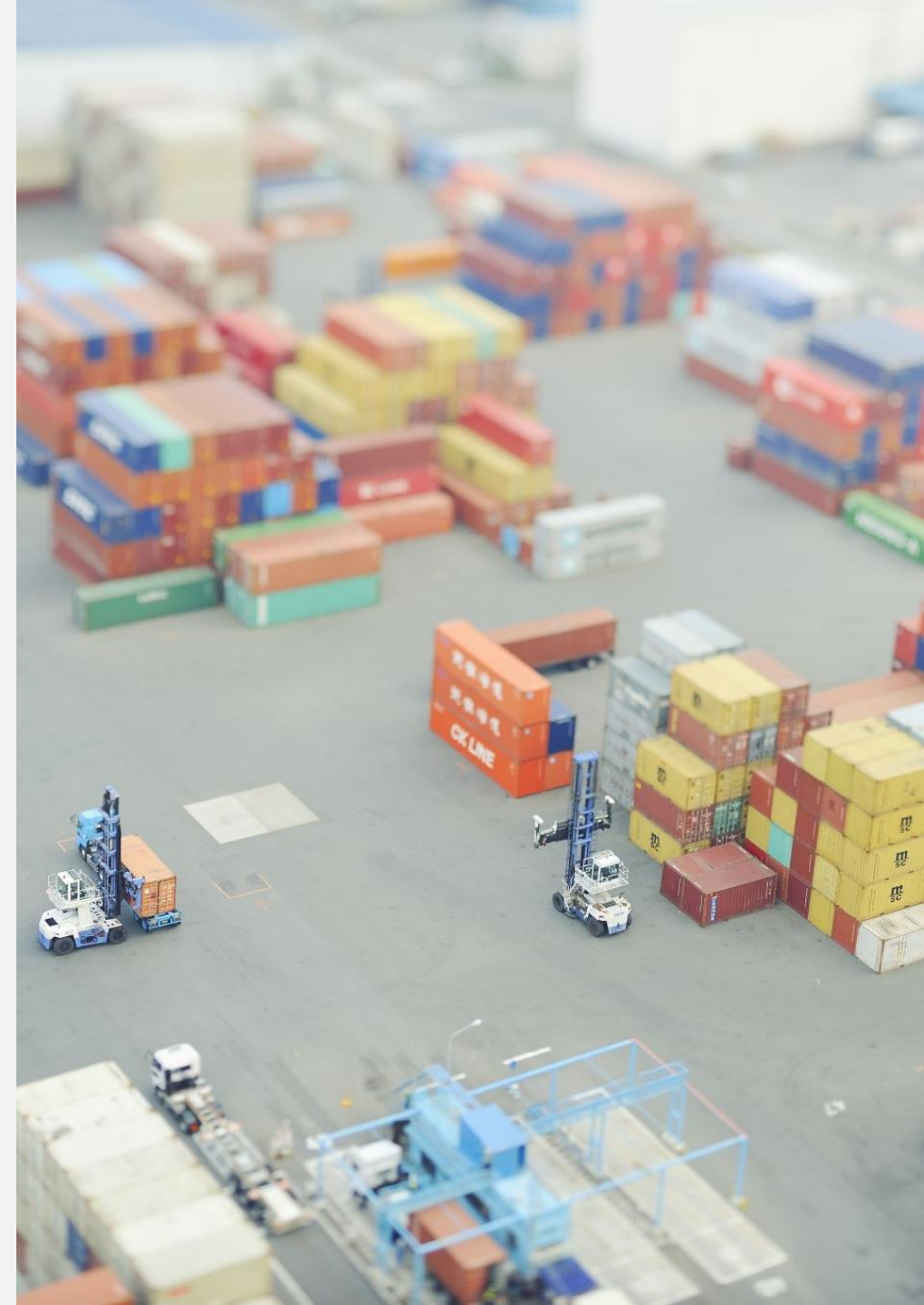
- Despite fewer voyages, **San Antonio** in Chile has the highest estimated fuel demand
- Ports are spread across Asia, Oceania, and South America, with **Asian ports** dominating the list
- **Chinese ports** (Ningbo, Qingdao, Taiwan and Shanghai) show similar demand

E. Roadmap

- Demonstration of GM bunkering no later than Q4, 2025.
- Target scaled GM bunkering to commence within mid 2026 to March 2027.
- Other milestones
 - deploy Chinese/ overseas crew,
 - agree with oil terminal operators on modifying tanks,
 - Implement public education program
 - promote Hong Kong's initiatives.

F. HKUST's messages to maritime stakeholders

- Encourage early adoption
- Work out financial feasibility/ business model for tank modification
- Develop GM bunkering business as soon as possible
- MFM providers to come forward
- GM suppliers to come forward
- Certification providers to come forward



- END -



Other Green Fuels and Electrification

- Plan for ammonia storage facilities.
- Retain more local used cooking oil as feedstock for biodiesel production.
- Encourage to earn carbon credit to fund OPS and electric fast charging/ battery swapping.