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Port of Oslo

Safe hydrogen bunkering in the Port of Oslo

Hydrogen pilot study

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Nordic Roadmap Future Fuels for Shipping

Green Shipping Programme

Nordic Council of Ministers

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Green Shipping Corridor: Oslo – Rotterdam on liquefied hydrogen

The Cities of Rotterdam and Oslo Sign MoU Aimed Towards New Green Corridor Provided By Samstkip

4 October 2023

This week, a Memorandum of Understanding (MoU) has been signed by the City of Rotterdam and the City of Oslo. The two partners have a long history, having worked together for many years. The new corridor project will not only strengthen their relationship but will also accelerate "the green transition" to the maritime sector. Having a strong presence in both regions and being a pioneer in greener logistics, Samskip will facilitate the corridor service with what will be the debut of their anticipated *Next Generation Zero-Emissions SeaShuttle*.

- Samskip's two container feeder vessels will operate weekly using LH2 between Rotterdam and Oslo with several stops on the way
  - Savings of about 25,000 tons of CO2 emissions each year per vessel
  - Ambition: Start operation in Q2 2026
- The port of Rotterdam aims to become a green hydrogen hub
- The Port of Oslo's vision is to become the world's most efficient and environmentally friendly urban port

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Safe bunkering of liquefied hydrogen in the Port of Oslo

Overall objective: To identify the key barriers and port readiness for safe hydrogen bunkering of Samskip container feeder vessels in the Port of Oslo.

Current status on safety and regulations → **Bunkering location and concept (Task 1)** → **Key barrier study (Task 2)** → **Port Readiness level (Task 3)** → **Feasibility of bunkering LH2 in the Port of Oslo**

Pilot participants:

PORT OF OSLO · Norwegian Hydrogen · samskip · Statkraft · YILPORT OSLO · MENON ECONOMICS · GREENH · Sjøfartsdirektoratet Norwegian Maritime Authority

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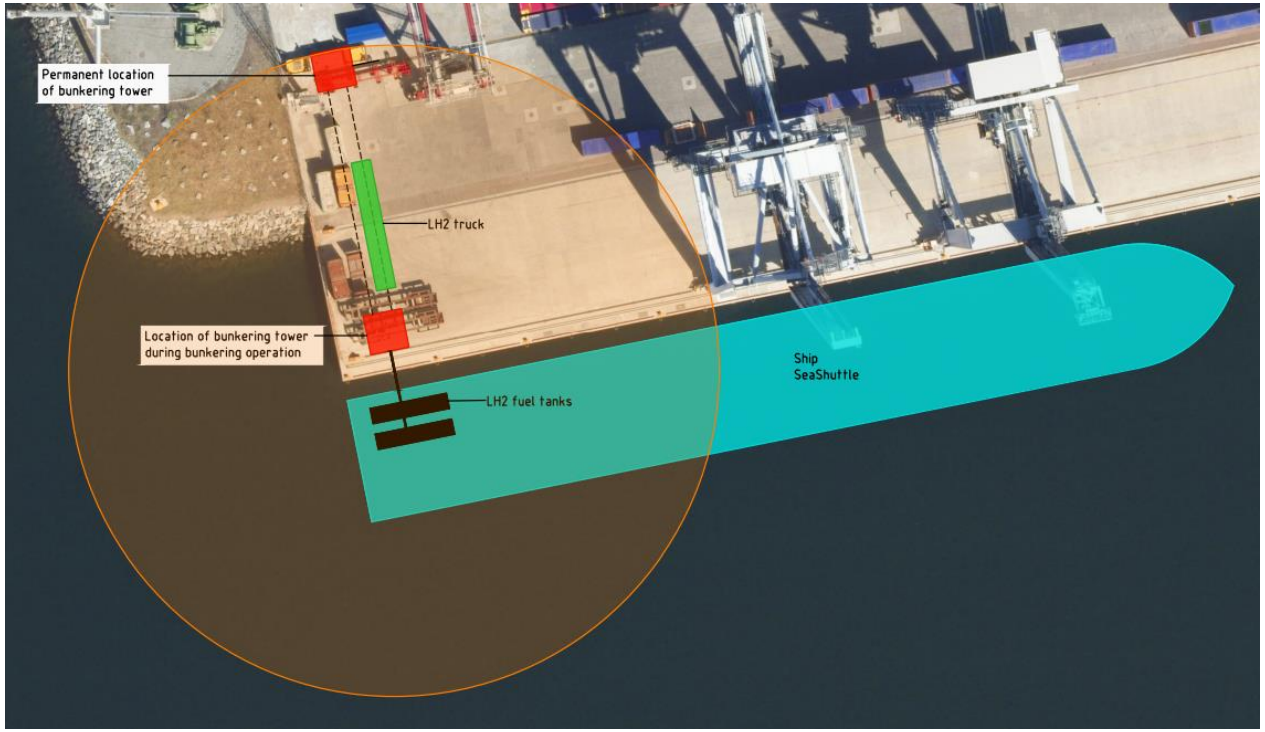
Task 1 – Bunkering, locations and safety considerations

Task objective: Identify bunkering needs for Samskip's hydrogen powered container feeder vessels and inspect potential locations for safe hydrogen bunkering in the Port of Oslo.



- **Truck-to-Ship** (TTS) bunkering, proven concept for MF Hydra
- Two potential locations in the port are evaluated based safety and operational feasibility

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Source: Safe Hydrogen Bunkering in the Port of Oslo, Pilot Study report (ongoing), Nordic Roadmap and Green Shipping Programme

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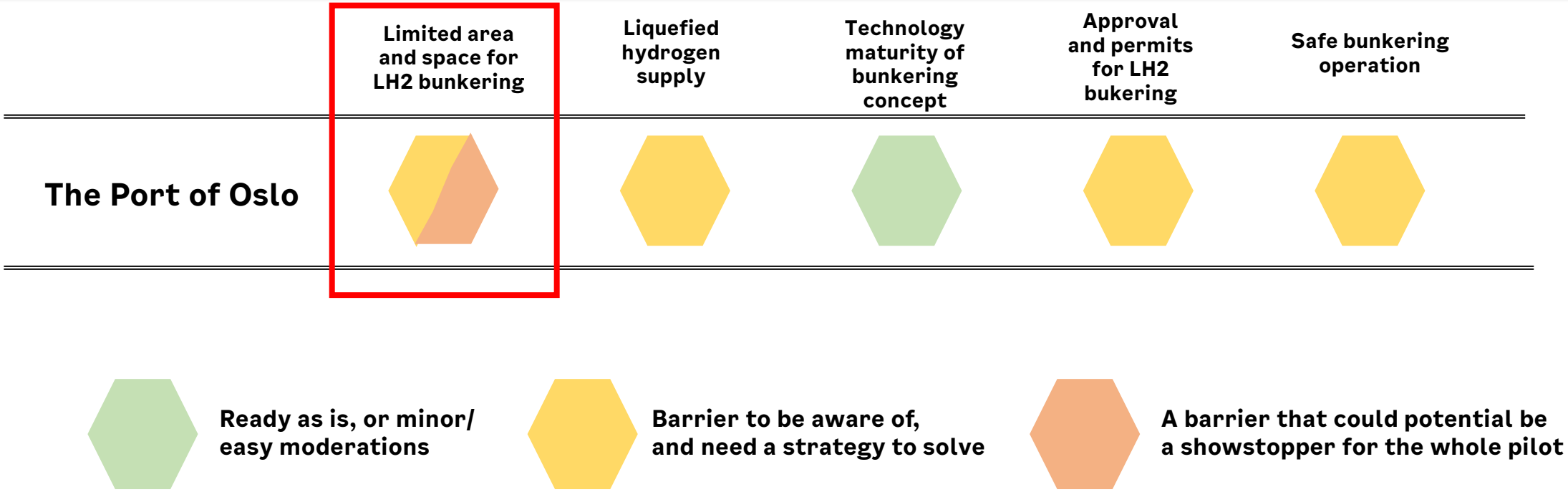
Task 2 – Investigating key barriers

Task objective: Investigate the key barriers for hydrogen bunkering of container feeder vessels in the port of Oslo.



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Source: Safe Hydrogen Bunkering in the Port of Oslo, Pilot Study report Nordic Roadmap and Green Shipping Programme

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Task 3 – Port readiness level for hydrogen bunkering

Task objective: Assess the port readiness level for bunkering of hydrogen for the Port of Oslo. Ongoing.

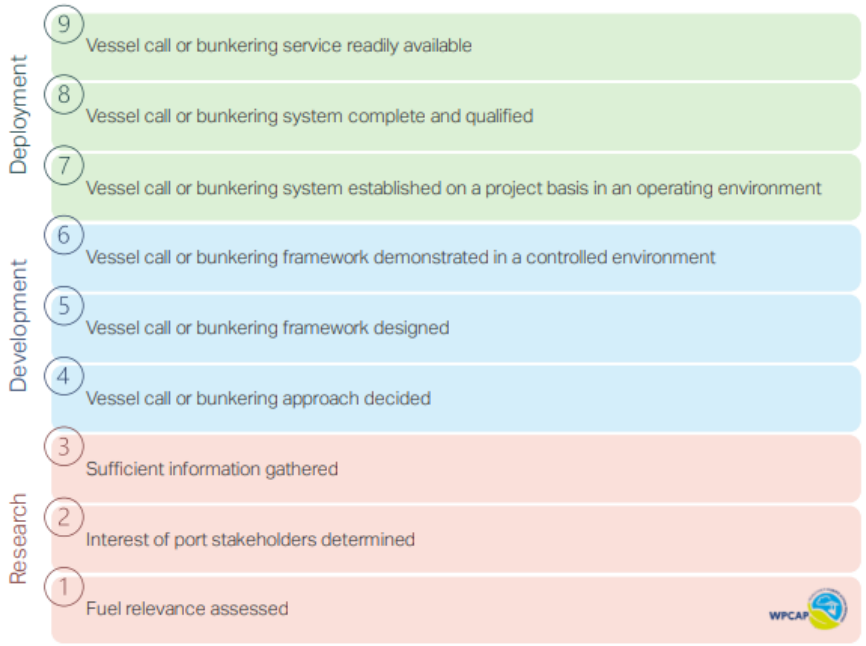

Figure 8 Port readiness levels.
Source: World Ports Climate Action Program (WPCAP).

Port readiness level – 2025

	LNG	Bio-methane	E-Methane	Methanol	Bio-Methanol	Ammonia	Hydrogen – pressure	Hydrogen – liquid
Port of Rotterdam	9	8	7	9	8	7	7	6

Port readiness level – 2030

	LNG	Bio-methane	E-Methane	Methanol	Bio-Methanol	Ammonia	Hydrogen – pressure	Hydrogen – liquid
Port of Rotterdam	9	9	9	9	9	9	9	9

Example from the Port of Rotterdam

Source: Northern European & Baltic Green Corridor Prefeasibility Study

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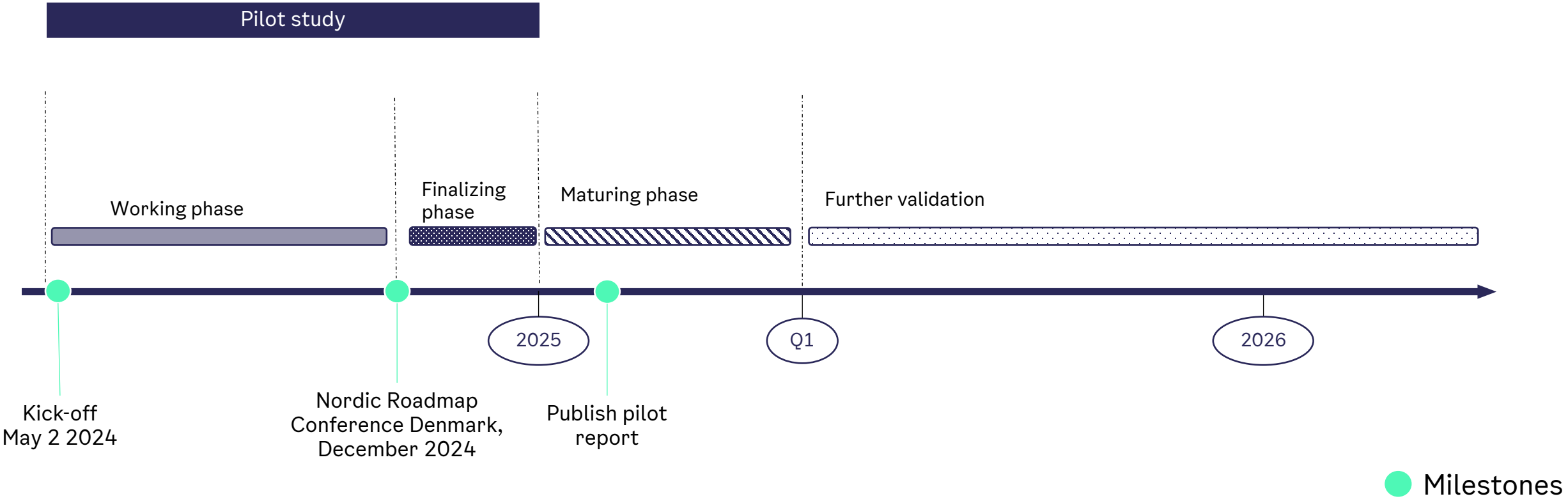
Timeline of bunkering hydrogen in the Port of Oslo



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Key Learnings

- Stakeholder involvement
- LH2 bunkering concepts
- Barriers for bunkering LH2
- First mover challenges

Thank you!

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