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Port of Oslo

Safe hydrogen bunkering in the Port of Oslo

Hydrogen pilot study

Oslo

Nordic Roadmap Future Fuels for Shipping

Green Shipping Programme

Nordic Council of Ministers

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Agenda

- Background for the Pilot study
- Methodology
- Safety considerations and regulatory framework
  - **Task 1:** Location assessment
  - **Task 2:** Key barriers for bunkering operations
  - **Task 3:** Assessment regarding Port Readiness Level

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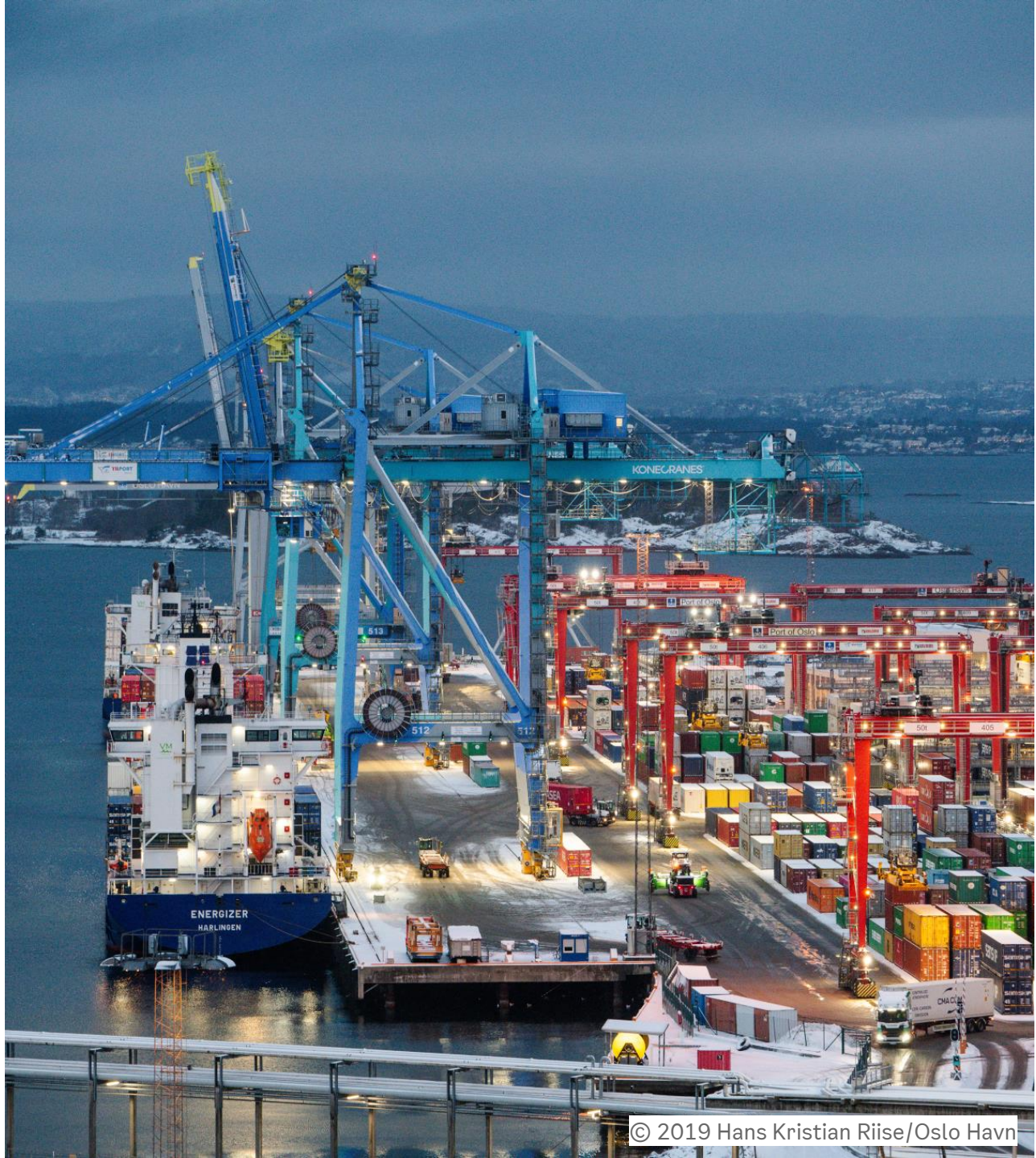

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Background for the pilot study

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

The Port of Oslo's vision is to become the world's most efficient and environmentally friendly urban port.

- Europe's largest container port, Rotterdam, have fixed weekly routes to Oslo, and aims to become a green hydrogen hub.
- In September 2023, the cities of Oslo and Rotterdam signed a MoU that will help establish emission-free transportation between the continent and Oslo.
- Samskip plans hydrogen-powered container feeder vessels operating on this green shipping corridor.

The Port of Oslo is interested in exploring the safety and regulatory barriers which remain a challenge for bunkering of hydrogen. Mapping of key barriers on a local level will provide a good overview of the current and expected readiness for hydrogen bunkering.

Sandvika, Norway 2019

Pilot partners

samskip

YILPORT HOLDING INC.

Nordic Council of Ministers

GREENH

Statkraft

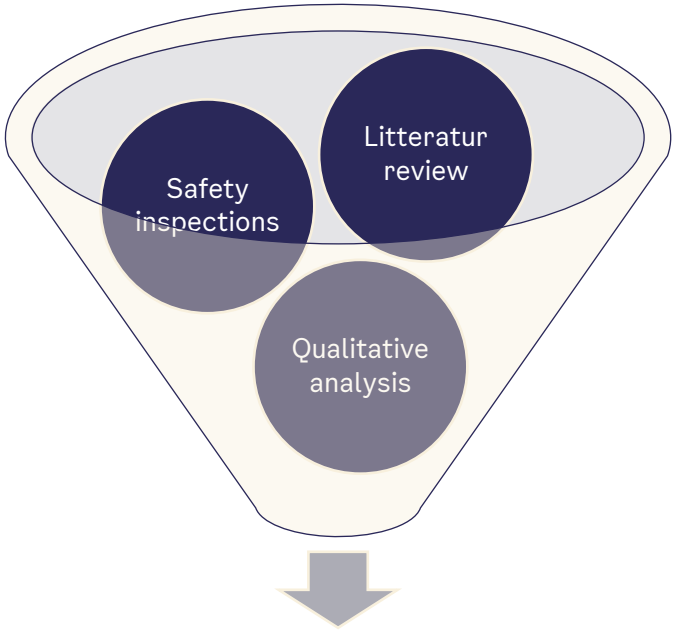
Norwegian Hydrogen

DNV

Sjøfartsdirektoratet
Norwegian Maritime Authority

MENON ECONOMICS

Methodology



Task Report

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Task 1 – Bunkering, locations and safety considerations

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

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Port of Oslo

466
Calls

240 000
Containers

2024
figures

Oslo


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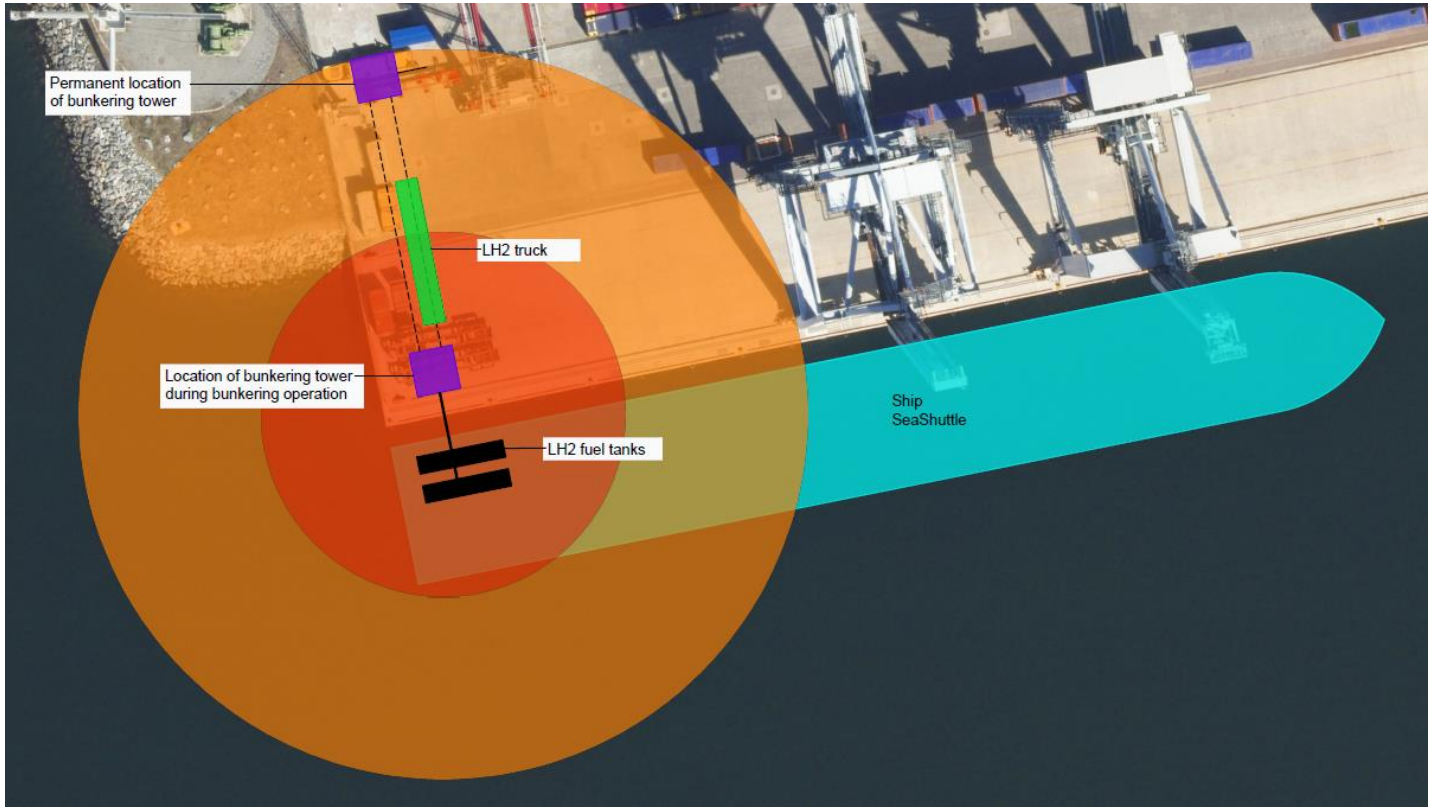
Task 1 – Location A



Outcome: Bunkering concept and locations is decided. Safety concerns is investigated

- **Truck-to-Ship** (TTS) bunkering concept, similar to Norled Hydra hydrogen ferry
- 2 locations in play: East or West on the container quay
- Safety aspect is challenging as no safety guidelines exist. **LNG guidelines*** is used as **minimum** requirements (**25** meter), but could be **50** meters, or more…
    - **Key question:**
    - Can the vessel berth either way? (Bunkering manifold on both sides is planned)
    - Is SIMOP possible? (Unloading stern of the ship first, safely)
    - Is quayside installations safe? (Shore power connection, STS crane powerline, etc)

*Link: Port of Gothenburg LNG Operating Regulations

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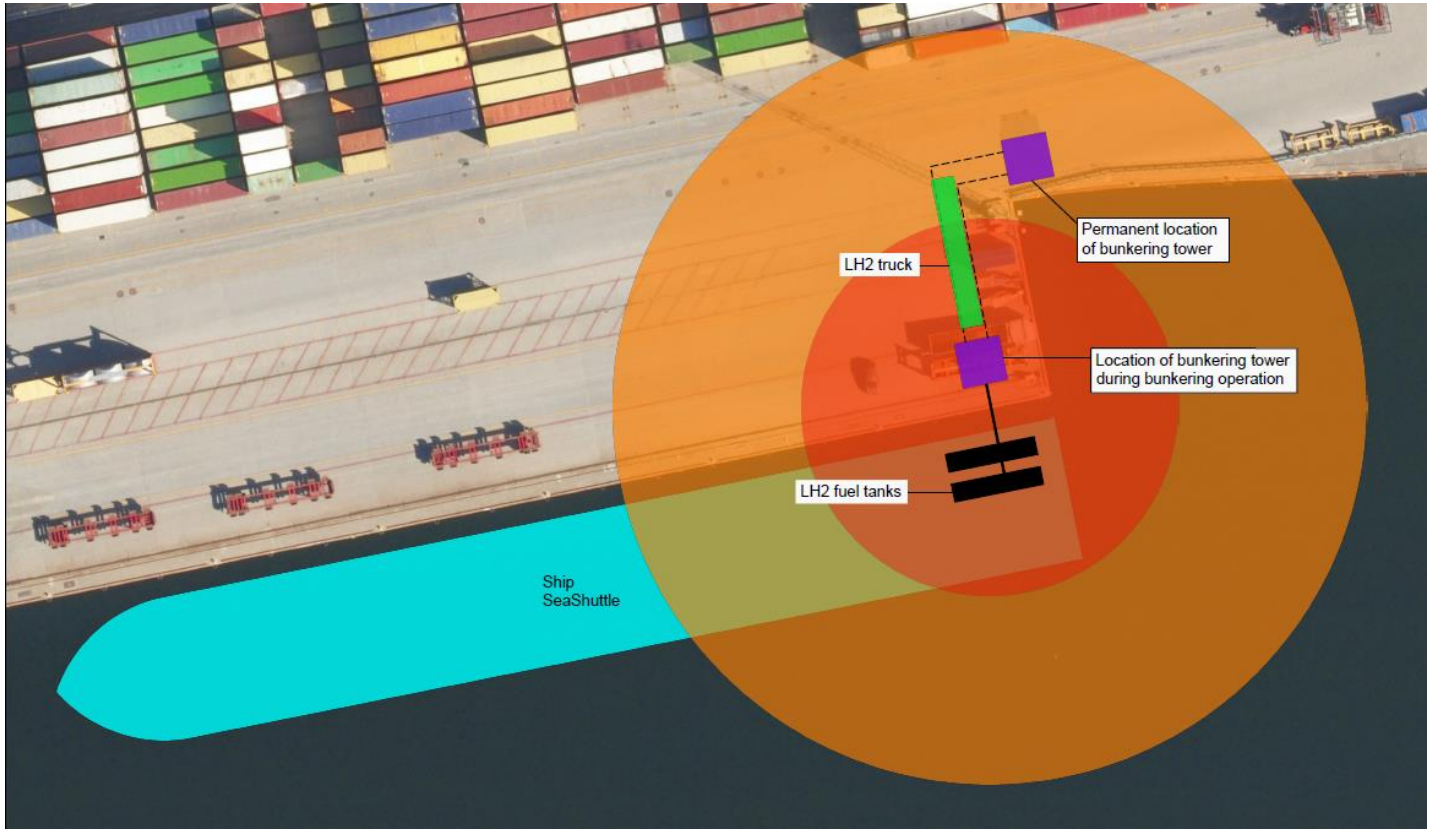
Task 1 – Location B



Outcome: ~~Bunkering concept and locations~~ is decided. Safety concerns is investigated

- **Truck-to-Ship** (TTS) bunkering concept, similar to Norled Hydra hydrogen ferry
- 2 locations in play: East or West on the container quay
- Safety aspect is challenging as no safety guidelines exist. **LNG guidelines*** is used as **minimum** requirements (**25** meter), but could be **50** meters, or more…
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    - Is quayside installations safe? (Shore power connection, STS crane powerline, etc)

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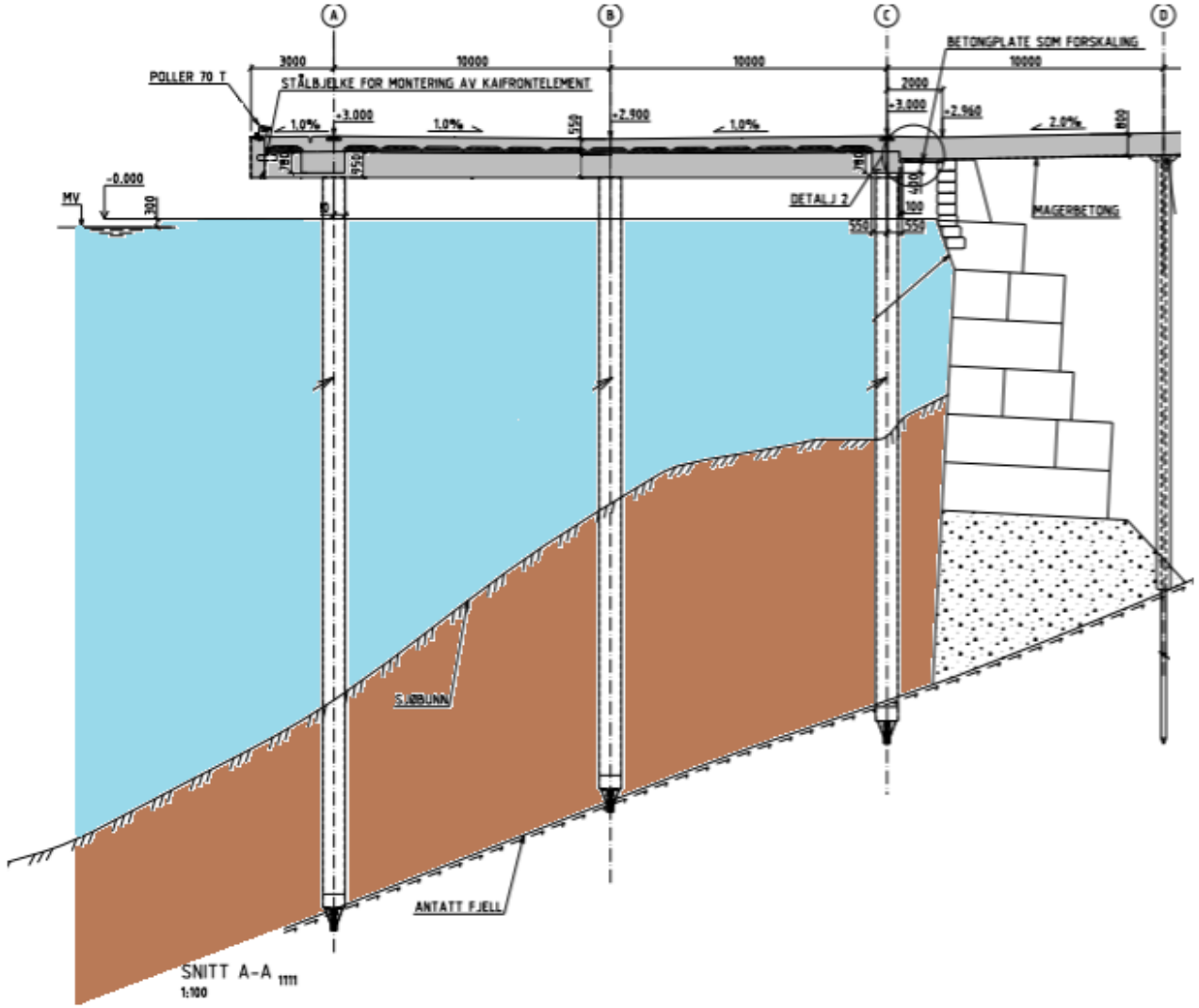
Task 1 – Quaside installation

- Shorepower
- STS crane power cabels and rails
- Space under the concrete cover



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Norled Hydra bunkering concept

- Norled Hydra with Linde bunkering tower and trailer
- Bunkering since april 2023

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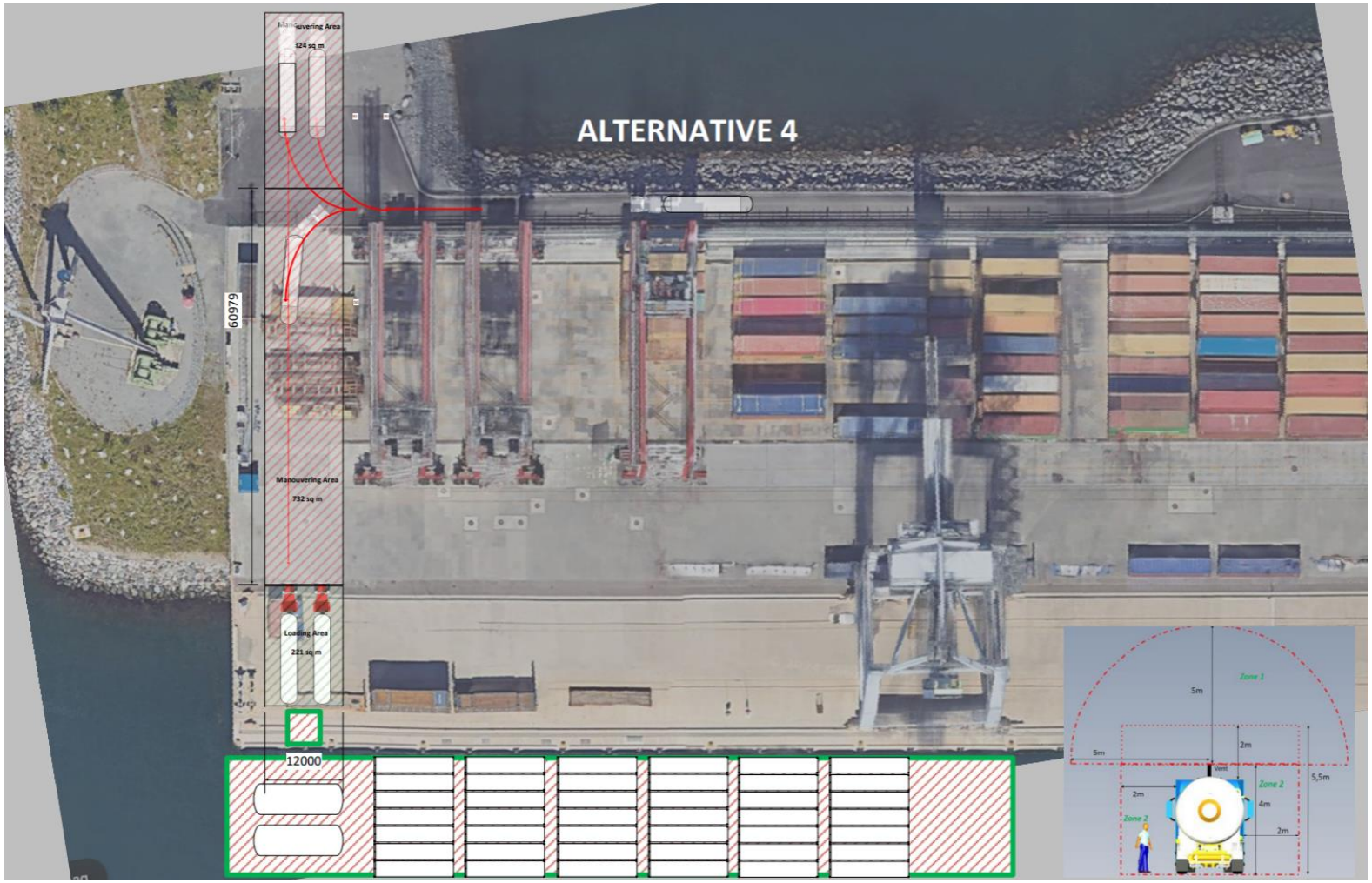
Acces way to the bunkering spot

- Acces without interfering with port operations
- Amble space for manouvering
- Outside Ship-to-Shore crane operations



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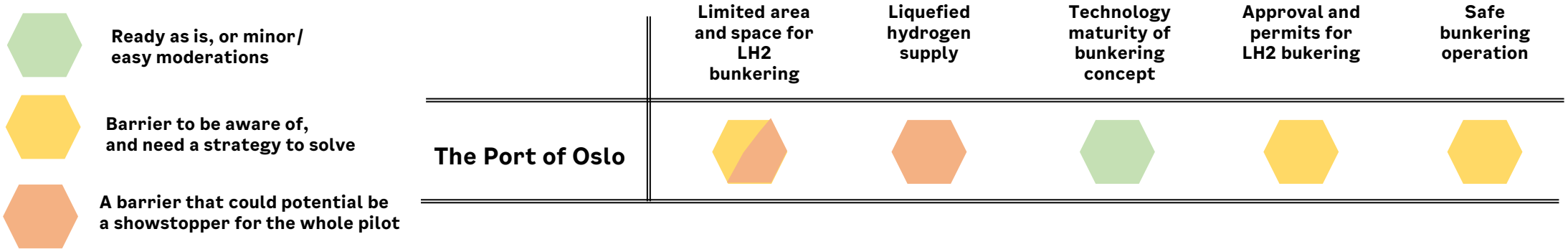
Task 2 – Investigating key barriers

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



Source: Safe Hydrogen Bunkering in the port of Oslo, Pilot Report, 2025

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Task 3 – Port readiness level for hydrogen bunkering

Objective: Assess the port readiness level for bunkering of hydrogen for the Port of Oslo and for Port of Rotterdam (already carried out).

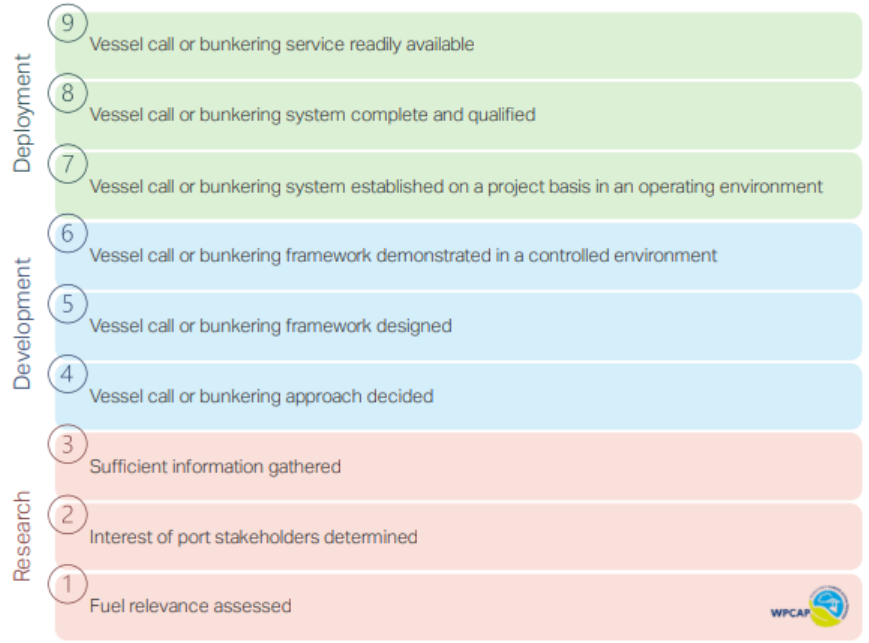
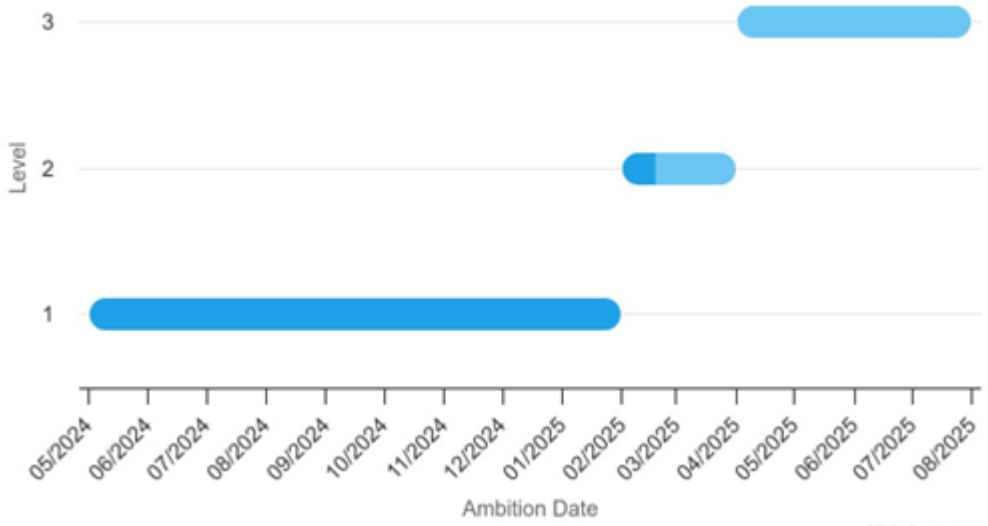


Figure 8 Port readiness levels.
Source: World Ports Climate Action Program (WPCAP).



Source: Safe Hydrogen Bunkering in the port of Oslo, Pilot Report, 2025

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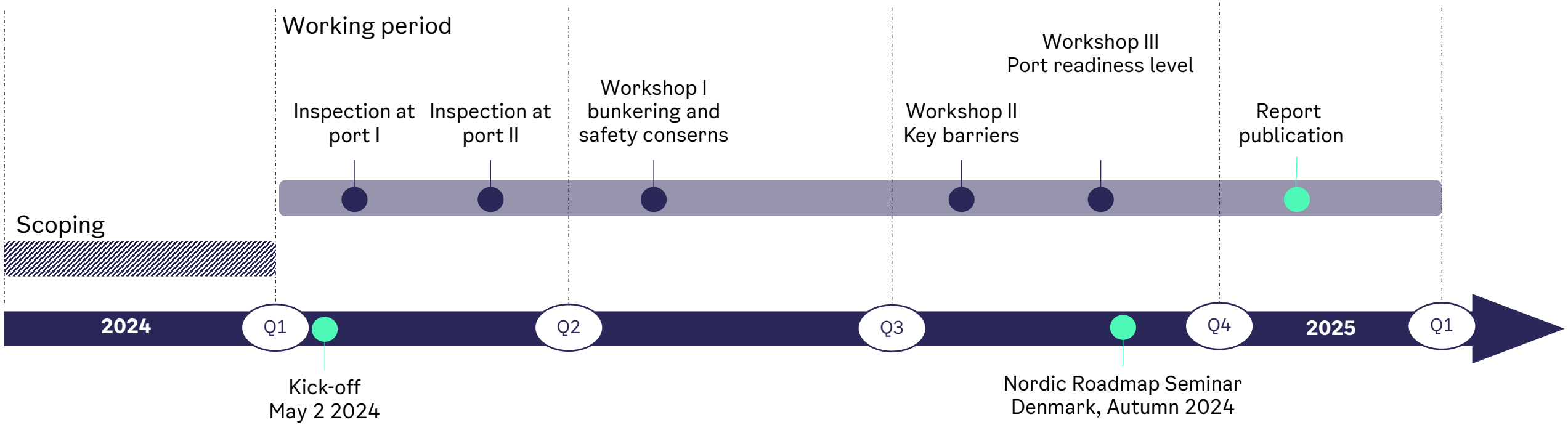
Timeline for pilot study



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Key Learnings

- Stakeholder involvment
- LH2 bunkering consept
- Barriers for LH2 bunkering
- First mover challenges

Thank you

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