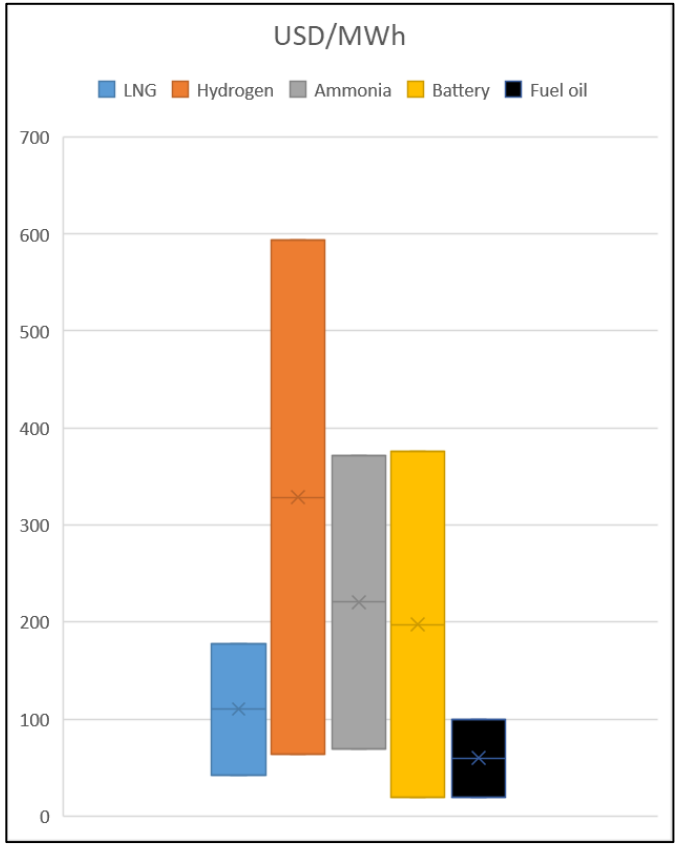
Autonome skip på Hitra?

Ørnulf Jan Rødseth, SINTEF Ocean
OrnulfJan.Rodseth@sintef.no

Hvorfor autonome skip?

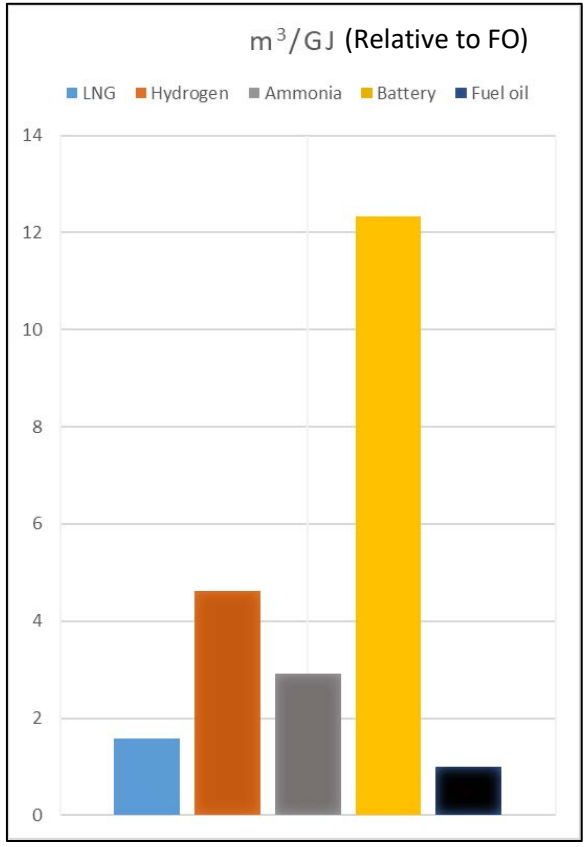
Development goals is a main driver

Drawbacks of low-carbon fuels



Cost of Energy

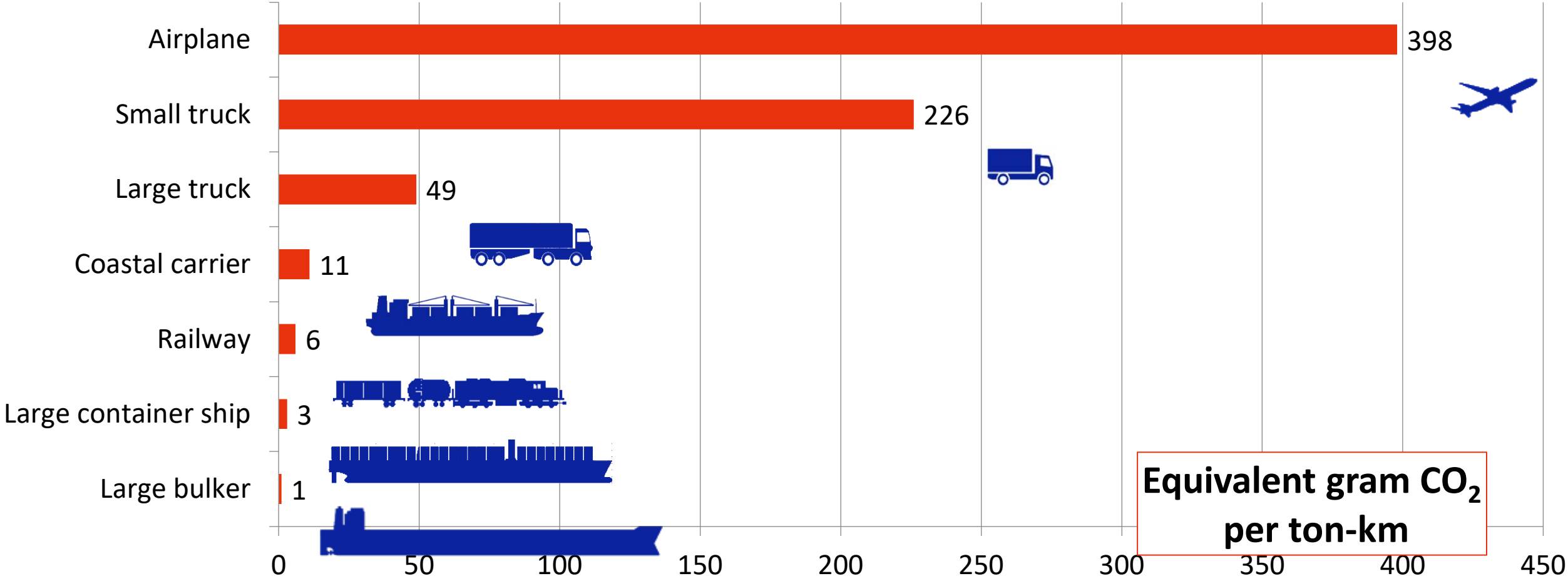
DNV GL: Comparison of Alternative Marine Fuels SEA\LNG Ltd



Volume of Energy

IRENA: Navigating the Way to a Renewable Future: Solutions to Decarbonise Shipping

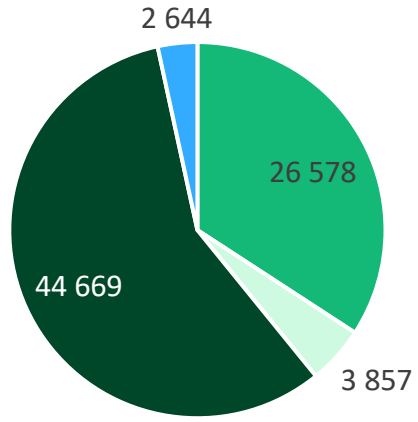
Higher fuel cost drives lower energy use



Sources: IMO 2nd GHG Study, Maersk, Intertanko

Reduction in road traffic is an important goal

Truck queues – space use

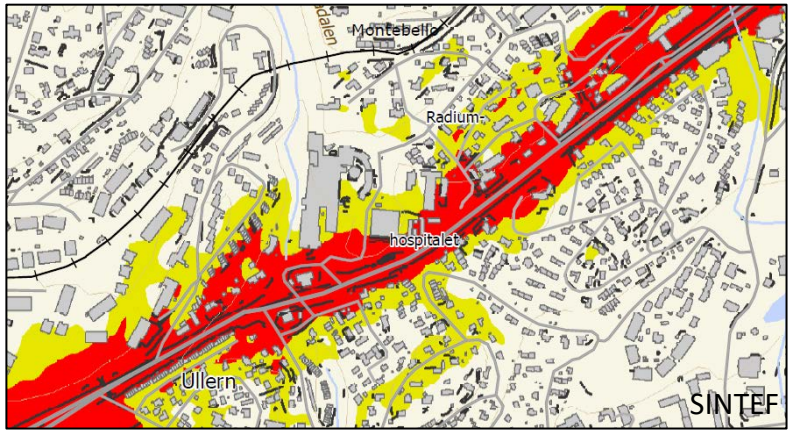


Investments planned, Norwegian Transport Plan 2018 (MNOK).

Infrastructure cost

Particulate matter

Noise



Winter road problems

Hva er status?

Two "small" short sea ship systems on order

Yara Birkeland

- Fertilizer for export
- Replace 40 000 trucks/year
- 100-150 TEU, 70 m x 15 m
- Batteries – Fully electrical
- In operation late 2021 – uncrewed 2024?

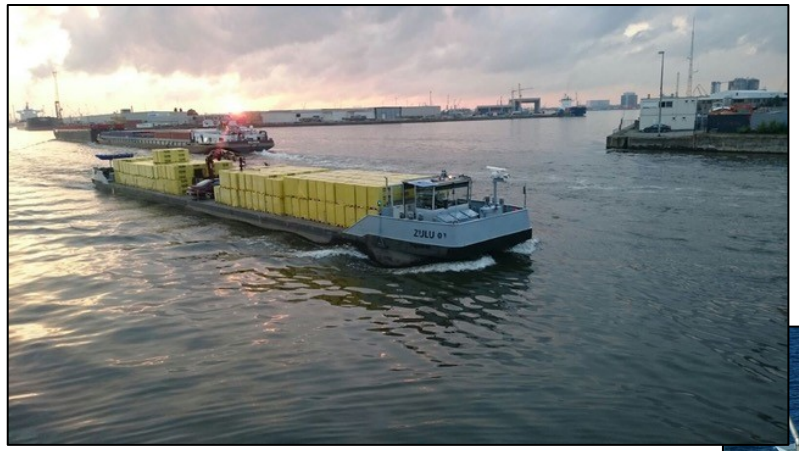
ASKO Maritime AS

- Connects wholesale warehouses at opposite sides of the Oslo fjord
- Part of a zero-emission transport system. Battery powered.
- Two 16-trailer RORO vessels, crewed from 2022, uncrewed from 2024.

Large EU projects

The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement N°815012.

AUTOSHIP
Autonomous Shipping Initiative for European Waters

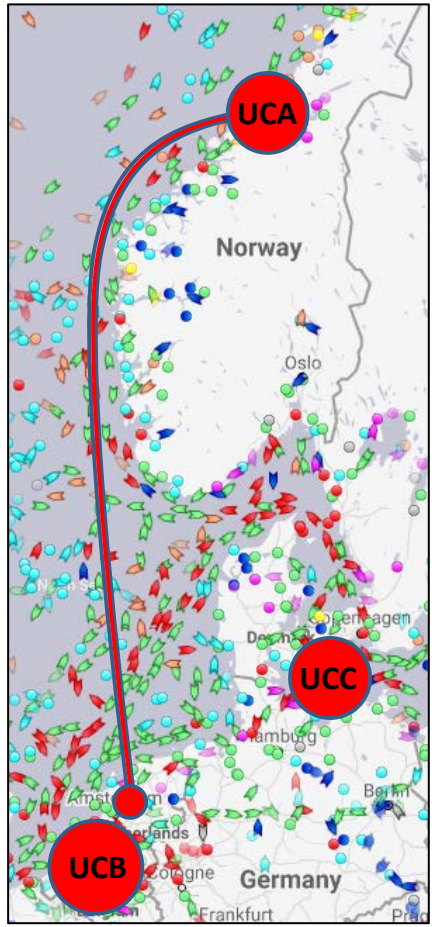


Demonstration project
Budget > 30 MEUR
Kongsberg largest partner

Eidsvaag

KONGSBERG

https://www.autoship-project.eu/



Aegis

Research project
Budget 7.5 MEUR
Coordinated by

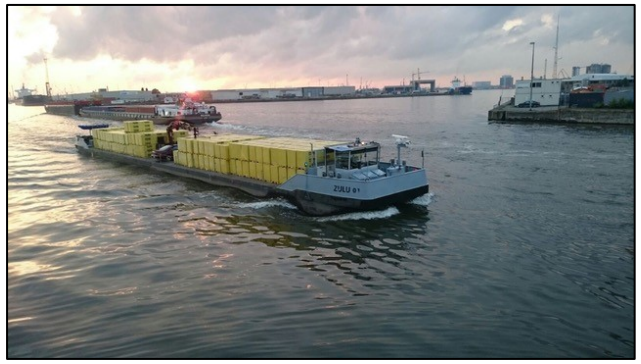
SINTEF

The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement No 859992.

http://aegis.autonomous-ship.org/

Some other developments

Surveys



Inland waterways

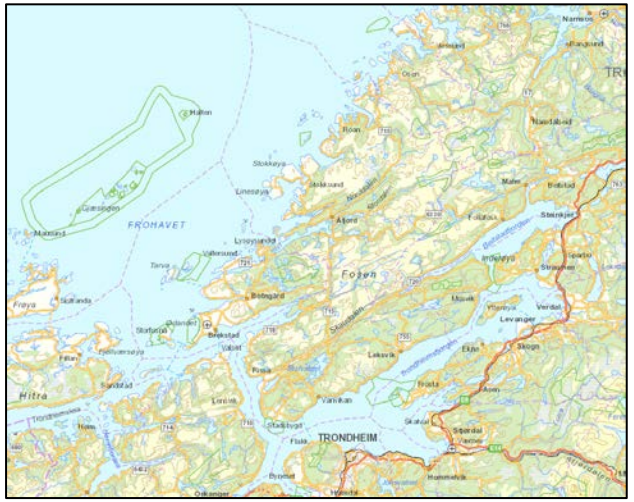
Automatic tugs

Automated road ferries

Autonomous urban mobility

"Driver assistance" at sea

Trøndelag is an international powerhouse!



Aegis

AUTOSHIP
Autonomous Shipping Initiative for European Waters

OCEAN AUTONOMY CLUSTER

Norwegian Centre of Excellence
NTNU AMOS

SFI · AUTOSHIP
Autonomous ships

NFAS
http://nfas.autonomous-ship.org

INAS
International Network for Autonomous Ships
http://www.autonomous-ship.org

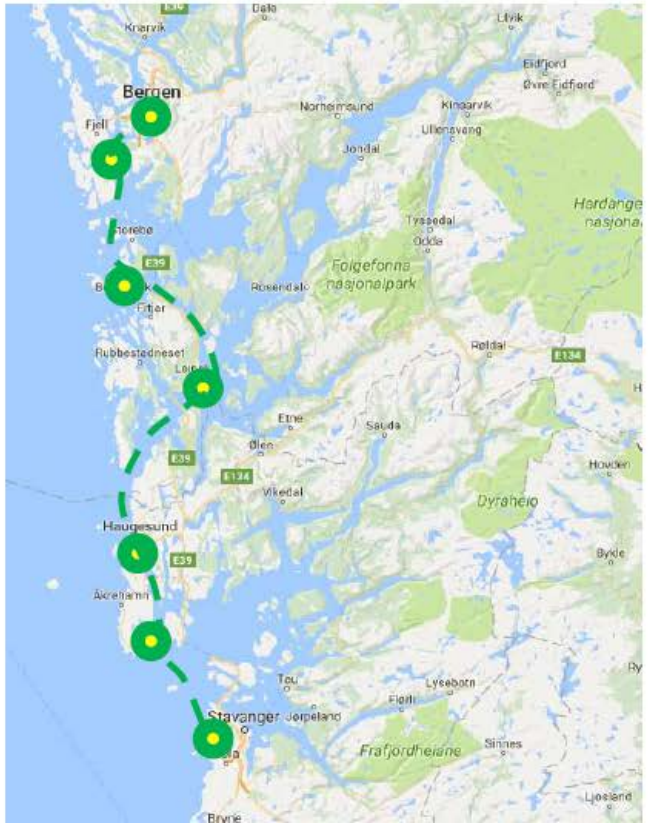
Hvilke muligheter finnes?

Better use of urban and enclosed waterways

- Avoid bridges
  - Blocks other ships
  - Costly
- Flexible and lower cost
  - On-demand operations
  - 24x7 operation without crew
- Environment
  - Battery operation
  - Silent, no congestion
  - Better use of infrastructure

Green Coastal Shipping Programme

Operational area



Vessel

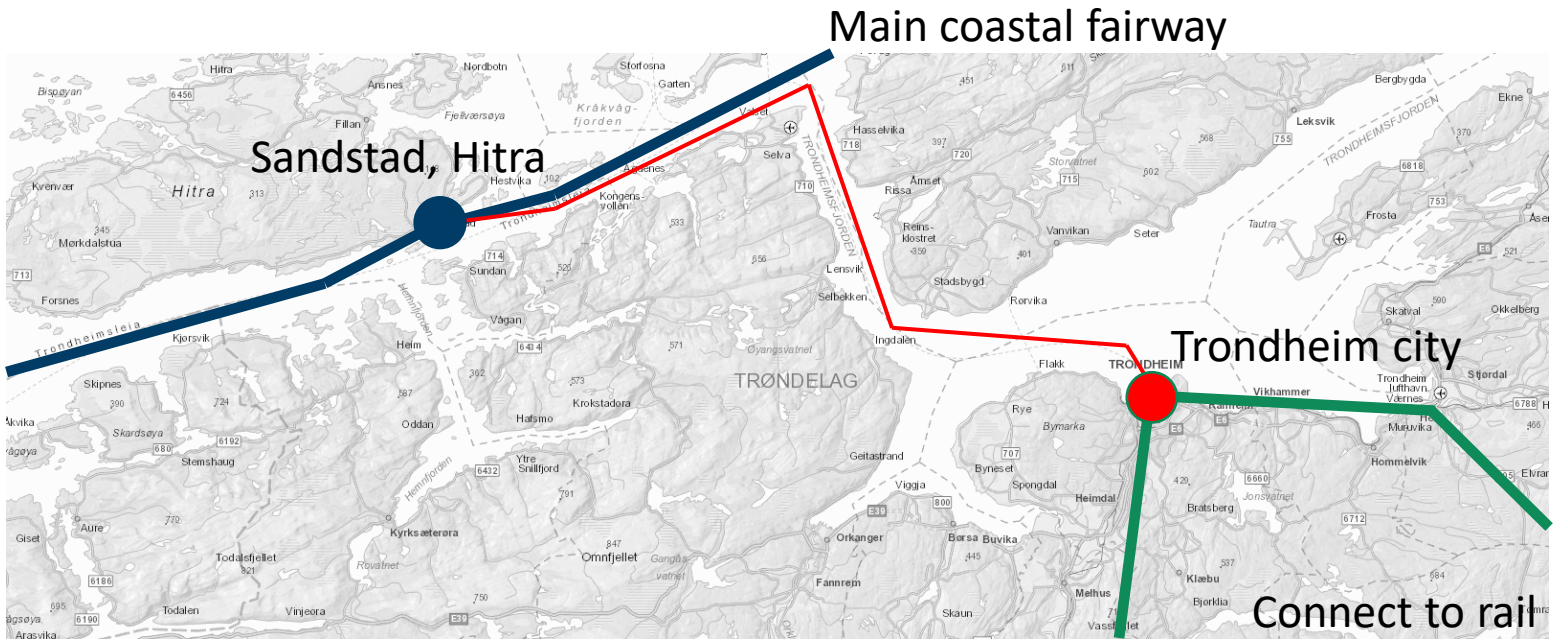
Plug in hybrid.
Battery powered during normal operation.
Speed: 12 kts
Operational range: 100nm
Capacity: 100 TEU
1300 DWT
LOA: 60 m

Ports in cities are under pressure

Port of Trondheim, Norway

- Area use
- Noise
- Traffic

New local cargo transport concepts



Many smaller feeder vessels require little space in city terminal.

May use RORO!

Sheltered water

Local transport in Trondheimsfjorden

Lumber: Orkanger-Follafoss/Skogn

Gravel: Verrabotn-Trondheim

Pallets, containers: Jøsnøya – Orkanger/Trondheim/…

SEAFAR

Map: Google Maps

It is a transport system!

Cargo Owner

Ship operators

Yard and equipment providers

Ports and hinterland

Konklusjoner

- Autonome skip kommer
- Trøndelag er ledende nasjonalt og internasjonalt
- Interessante muligheter med mindre skip i og rundt Trondheimsfjorden
- Lokalt, feeder til linjeskip, kobling til tog – bulk eller enhetslaster
- **Muliggjørende i Norge: Samarbeide lasteier, verft, skipsoperatør og havn**

SINTEF

Thank you for your attention!