

New Ferries to Nordic Ferry Services

MDO? or LNG ??

Routes

The Operation

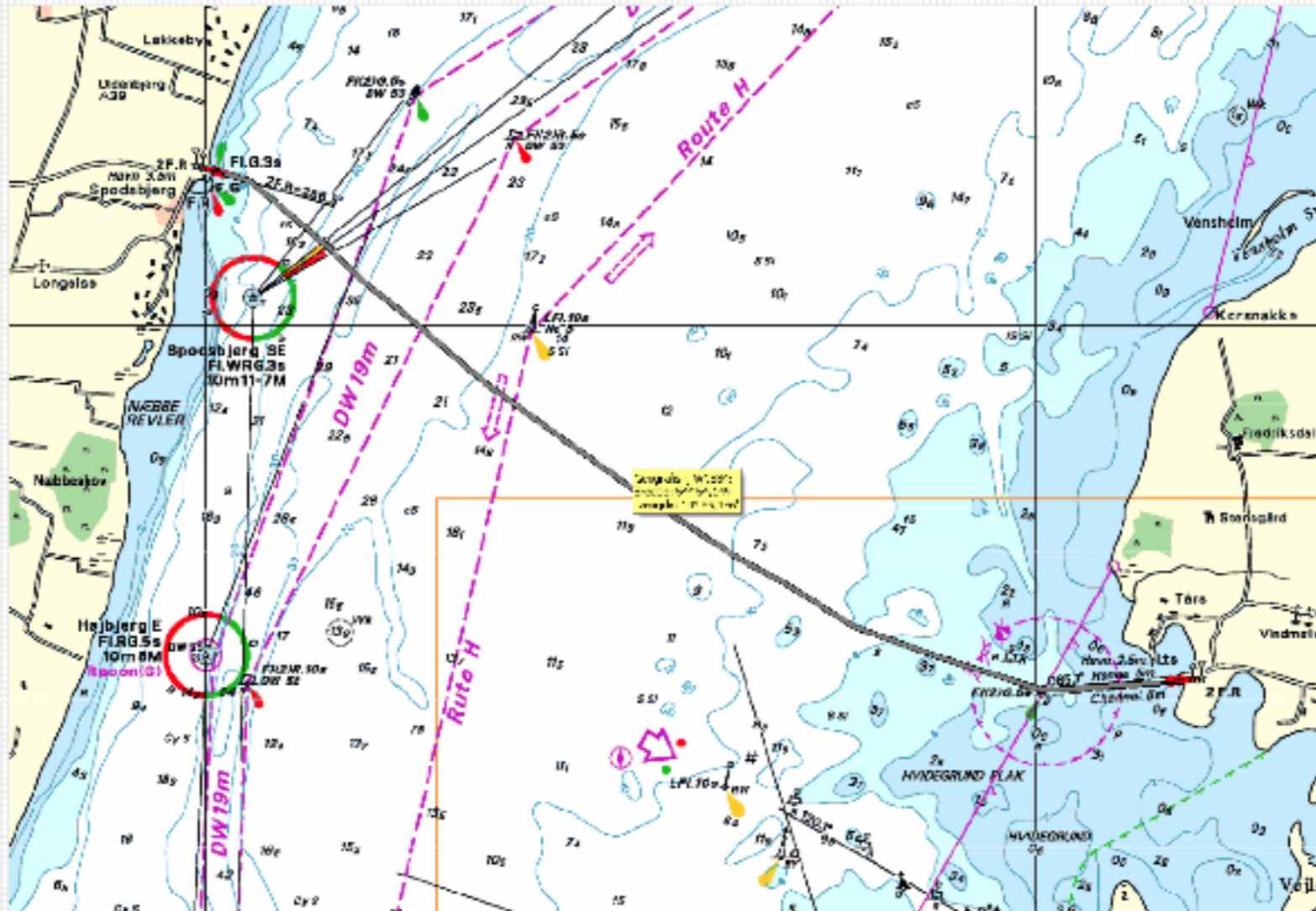


Spodsbjerg Taars

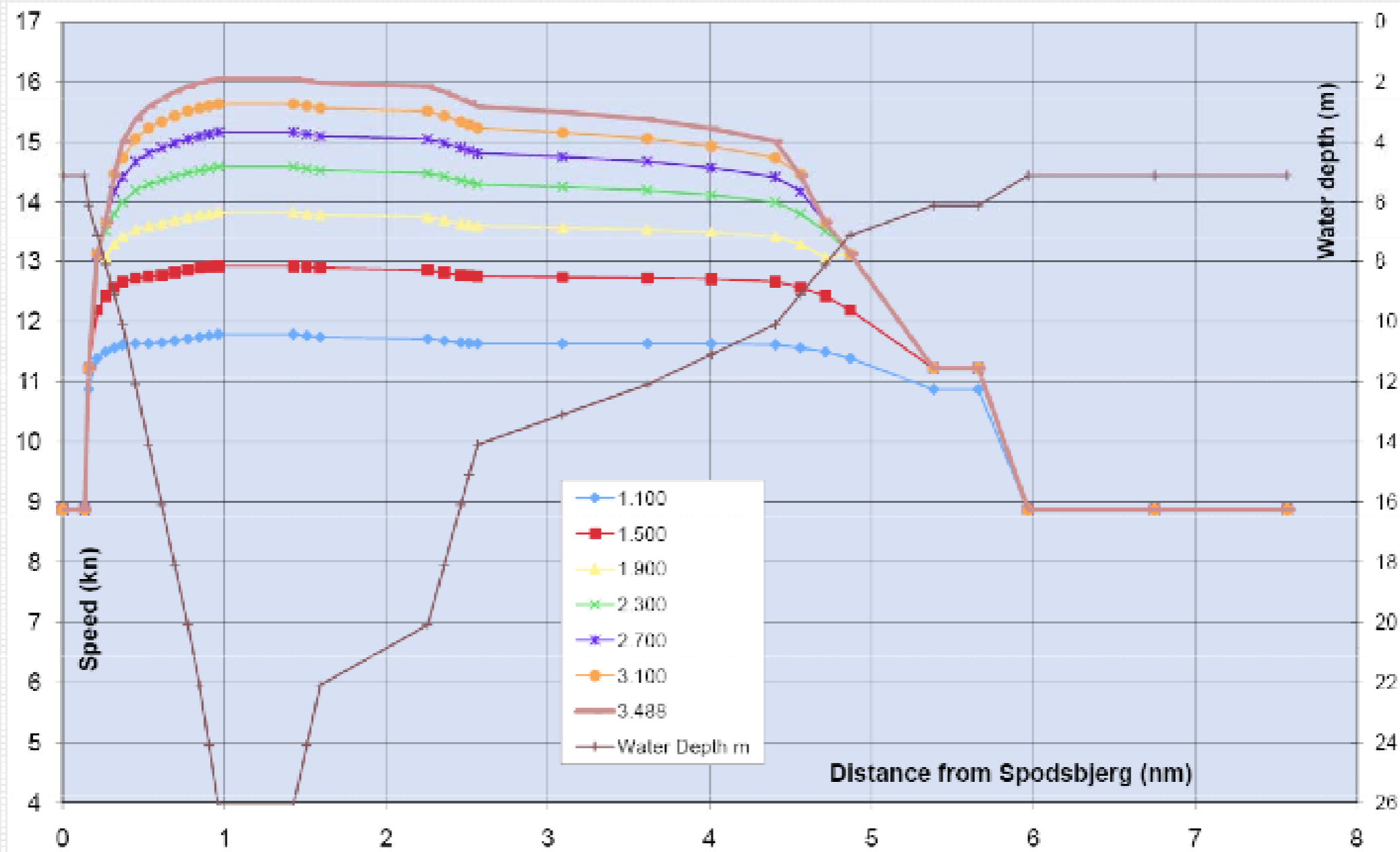
NORDIC FERRY SERVICES

New double-ended Ferry

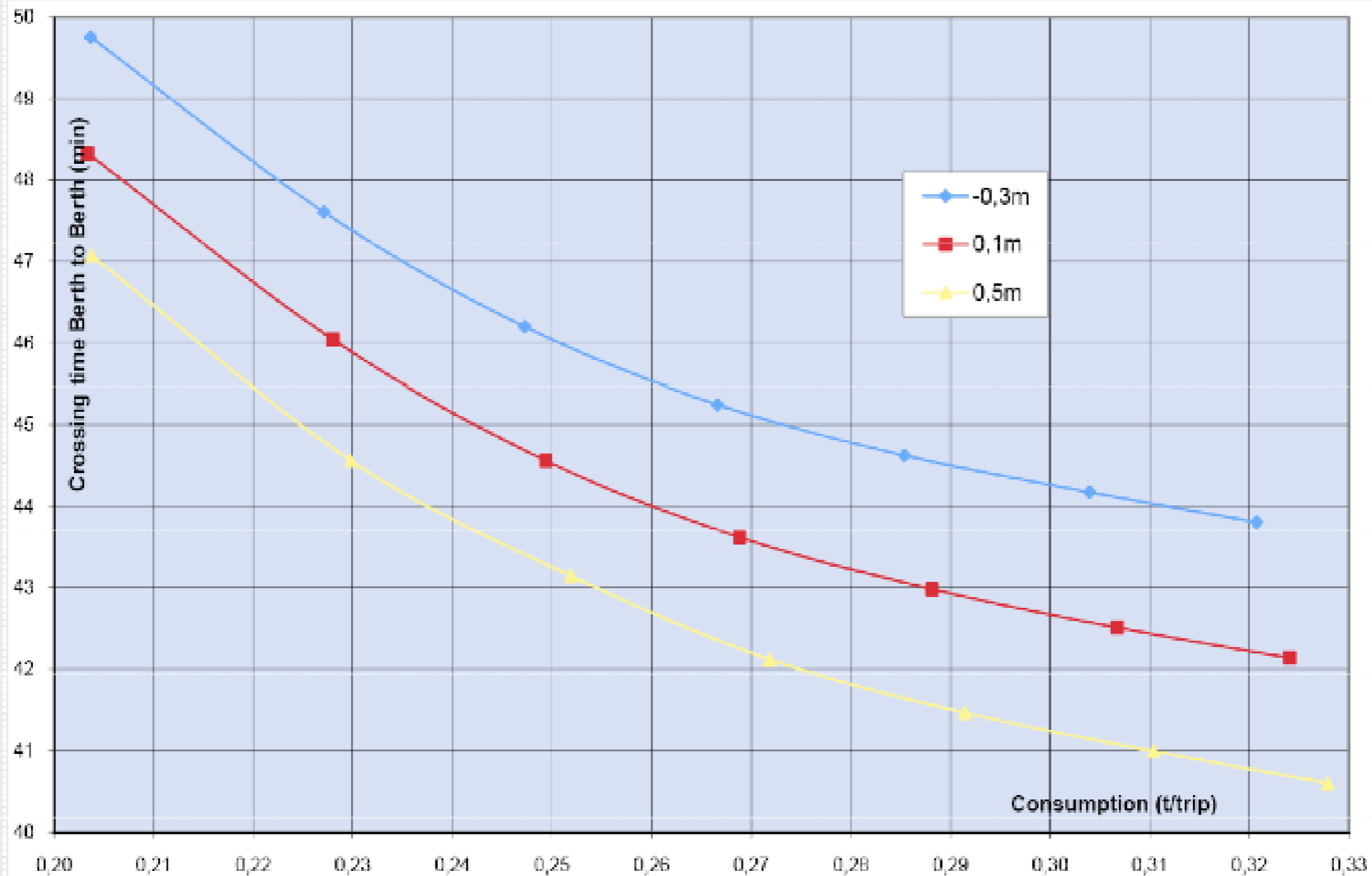
Langelands Trafikken - the route Spodsbjerg Tårs



The route Spodsbjerg Tårs – Speed / Water depth

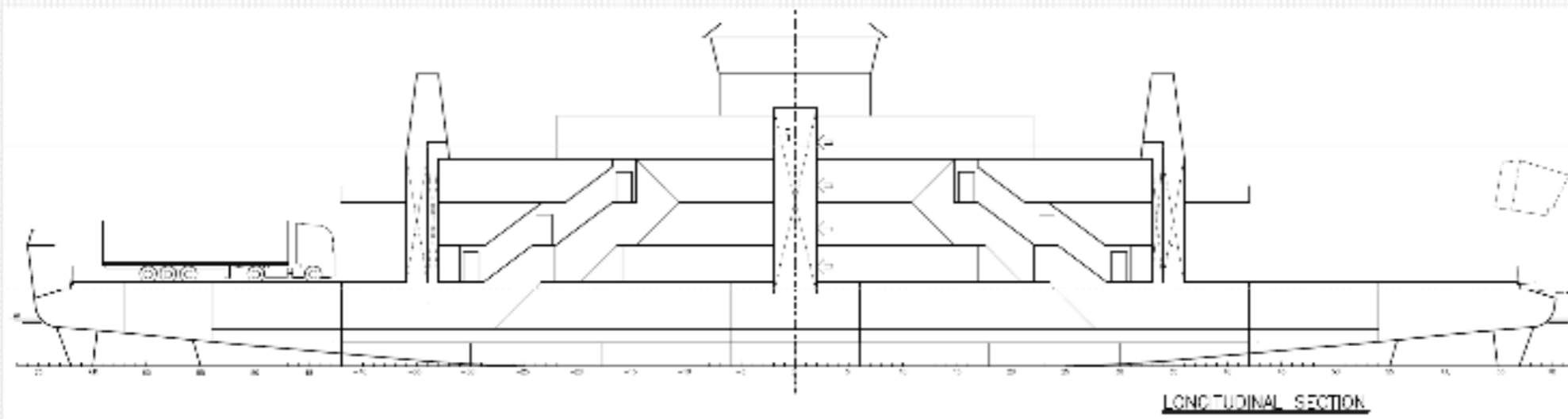


The route Spodsbjerg Tårs – Oil consumption t/trip



The new ferry

The Ferry – Arrangement of stair and casing



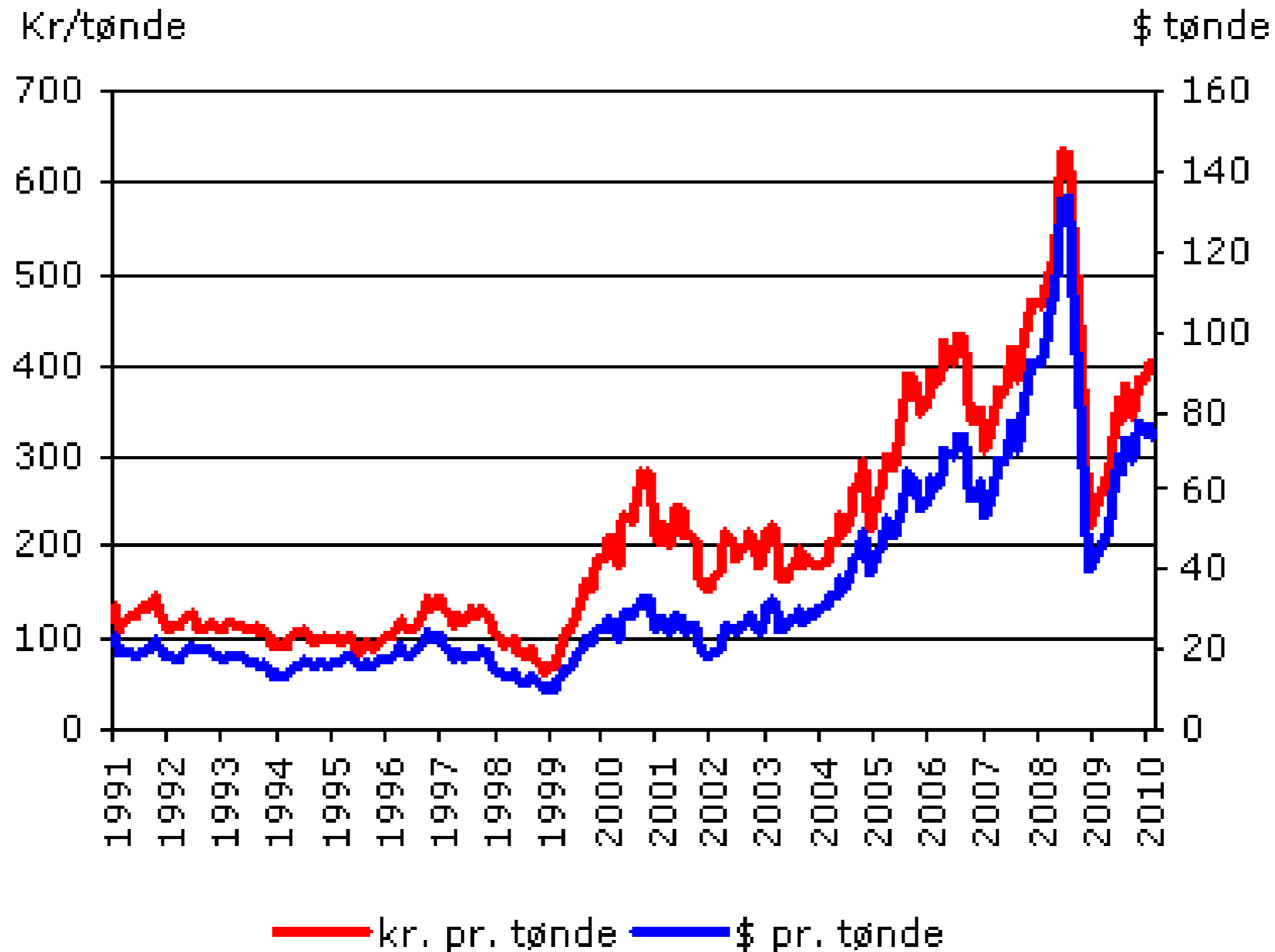
LNG or MDO or both

- Two engine rooms, one for MDO and one for LNG Each abt 2400 KW
- 35 M3 LNG tank in between. Capacity for 3 day's operation
- Ferry can operate on 2400 KW i.e. either on LNG or MDO

Why LNG

- All (most) all NFS ferry route are on 6 years public contracts. With fixed income
- Abt 35 % of our cost is Fuel
- Dec 2009 our offer for Spodsbjerg Taars was based om fuelcost 12 mio. DKK/year
- Two moths later, February 2010, at signing, fuel cost was 17 mio DKK/year!

Oil price fluctuations



Oil versus LNG price



Theory and practice

- Will a small shipowner be able to use these makro price indications ?
Hardly!!
- LNG price will most probaly be linked to oil price, but may be at bit less volatile
- But there are other reasons to shift to a cleaner fuel

Why LNG

- The ferry we build today have a lifetime of 30 years!!
- We do not believe that MDO, however cleaned, will be feasible as future fuel.
- LNG is cleaner and in general more available. Seen in a long term perspective

BUT

- LNG logistics requires an expensive net of LNG terminals. Capacity 10.000 to 100.000 M3. Such plant are financially in a scale beyond the means of a normal ferry operator
- LNG distribution by tankers to smaller scale terminals has to be developed
- LNG is in general available in Norway, and in the future also in Sweden, but official supported.
- LNG marketplace is still not as mature as the oil market

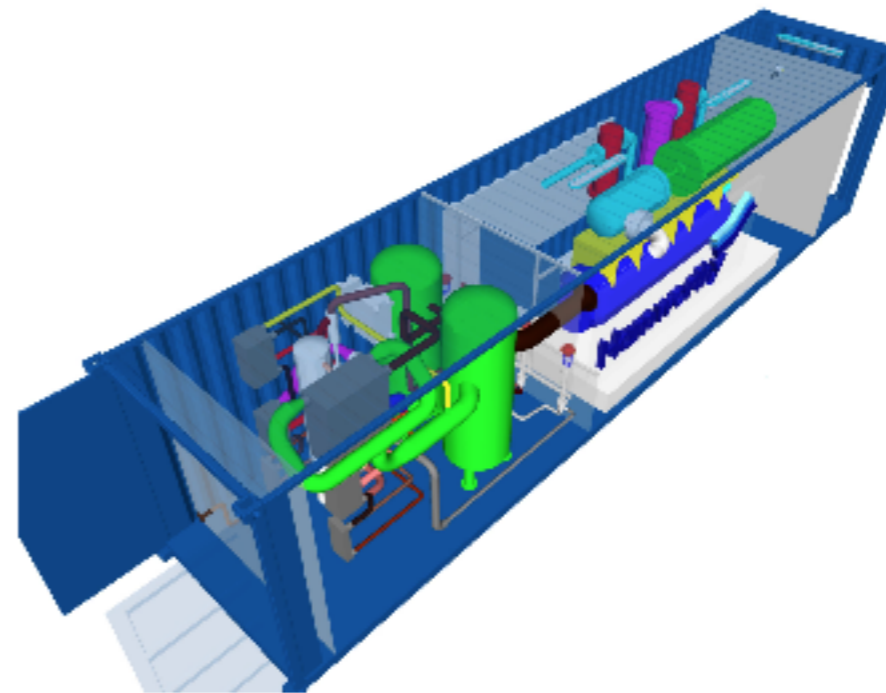
What are the possibilities for a small scale operator

- Our 3 small ferries requires 35 M³/3 days i.e. only 10.000 M³/year. Frozen LNG can stay cold abt. 3 moth in a well insulated tank. We thus need a 2.500 M³ terminal supported by 4 calls/year. But there are no 2.500 M³ LNG tankers. Average size of LNG tankers are 125.000 to 175.000 M³
- A 2.500 M³ terminal is extremely costly
- Which leave us with a small Scale LNG production plant solution

Small scale LNG plant 35 M3/day

MiniLNG™

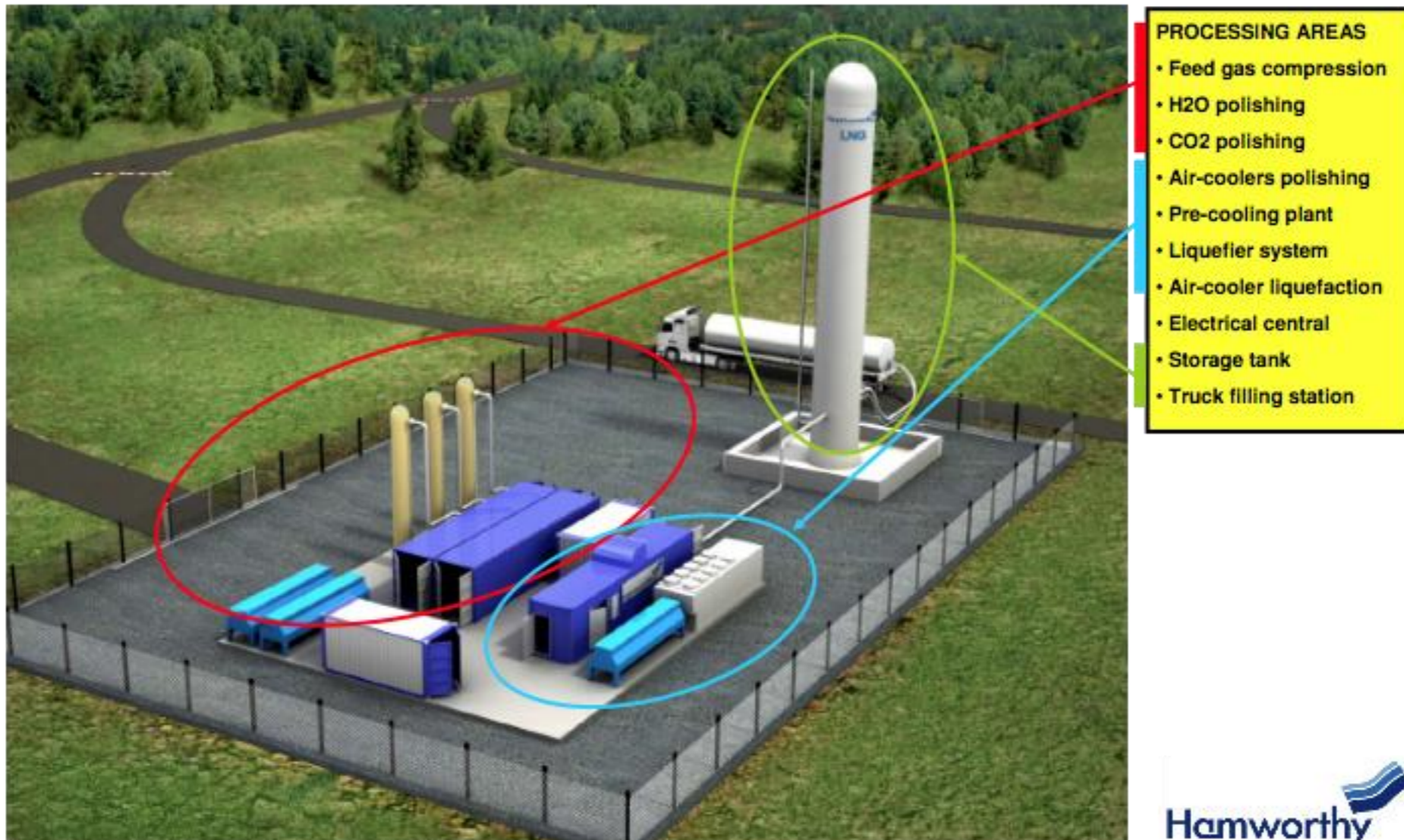
- ▶ Standardization:
 - ▶ Capacities: 15 tons LNG / day
 - ▶ Containerization
 - ▶ Options for customer:
 - ▶ Storage tank
 - ▶ Type of pretreatment
 - ▶ Electric power supply
- ▶ Manufactured at assembly site
- ▶ Easy shipment
- ▶ Plug and play philosophy
- ▶ Relocation possible



Small scale LNG plant layout

Technology description

Typical plant lay-out



The way forward

- a small scale LNG plant with input from the domestic NG net (available all over DK) will be an affordable solution. Lorry delivery of 35 M3/day to the ferries will keep the fleet running.
- But where will we place the Mini LNG plant (environmental concerns.)
- And will we be able to land a feasible agreement with a gas supplier?

LNG for our new ferries in DK

- We need to have LNG on our new ferries within the next 2-3 years.
- And in the remaining fleet at a later stage
- We could wait until a LNG infrastructure is ready. Where everybody waits for others to take the first step!
- That may take some time.
- Or we could start on our own!

- We intend to start now
- So: We have promises to keep!
But miles to go before we Sleep!
(Robert Frost)
- Thank You