Knowledge grows

Yara Birkeland

NorthSea commission

28th October 2021
Our Vision
A collaborative society; a world without hunger; a planet respected.

Our Mission
Responsibly feed the world and protect the planet.
Yara er et voksende globalt selskap

16 000
The number of people we employ

+150
The number of countries we sell to

60
The number of countries we operate in

240 million
people our products help to feed

50 million
citizens our products deliver fresh air for

240 million
tons of grains our products help produce

*20 million
The number of farmers we work with

Countries with sales
Sales offices and R&D sites
Production sites
Smaller sites*
Phosphate mines
Joint Ventures
Head Office

* Yara operated terminals and logistical production sites
Delivery chain from Porsgrunn

Yara Birkeland to replace trucks delivering containers from Yara Porsgrunn to Feeder Ports

~2.600 ktonn /yr - bulk

~500 ktonn /yr - container
“Where there is a will, there is a way».  Sam Eyde

From electric arch to electric vessel

Video : Sjøsetting Birkeland
Yara featured as one of 50 on Fortune’s Change the World list

Yara mentioned specifically in announcement of top 50 list (as one of only 9 companies named explicitly)

Top of the list are the vaccine makers—particularly those that have made extra effort to reach the least lucrative markets, like Johnson & Johnson and AstraZeneca, which are distributing huge volumes priced at cost. Other interesting entries: Costco (#3) and Bank of America (#9) for their aggressive efforts to raise wages at the bottom of the scale; Daimler (#6) for attacking the dirty secret of the electric vehicle industry—human rights abuses in the cobalt supply chain; PayPal (#7) for its commitment to Black and Latinx owned financial institutions; Maersk (#46) for its focus on clean fuels; Yara (#29) for its huge commitment to making African agriculture both productive and green; and Genpact (#45) for helping global businesses solve the COVID test conundrum. Spend some time with this list. It shows stakeholder capitalism can have powerful positive effects.
Reduction of local traffic and emission

Moving transport from trucks to Yara Birkeland
700 tonnes CO2eq/yr in reduction

~14,000 cars/day ordinary traffic at Herøyavegen

Yara Birkeland will reduce heavy weight traffic by ~10%
Project steps

Phase 1: Vessel A
Phase 2: Vessel B in operation
   Test to Vessel C
Phase 3: Vessel C in operation

Phase 1: Finalize quay.
Phase 2: Crane in manual operation
Phase 3: Terminal and crane automated

Legend:
- Wireless data communication
- Wired data communication
- Vessel travel route
- Tablet with wireless connection
- Yara's order system
- Yara's Production Support System
- Yara's container loading support system (Digital Lean Container)
- Kalmar Terminal Logistic System (TLS)

Note 1
Authonomous Vessel: Done by Shore Control center.
Manual Vessel: Needs to be determined.

Yara Porsgrunn Material handling area

Phase 1:
- No activity
Phase 2:
- Digital logistical platform
Phase 3:
- Part or full implementation
Vessel Design parameters

ESTIMATED FACTS & FIGURES

Main particulars
LOA 80 m
Beam (width) 15 m
Depth – main deck 8,0 m
Depth – Shelter Deck 10,8 m
Draught (full) 6,3 m

Speed
Eco speed 7-9 knots
Max speed 13 knots

Capacity
Cargo capacity 120 TEU*
Deadweight 3150 mt

Propulsion
Azipull pods 2 x 900 KW
Tunnel thrusters 2 x 700 KW

Batteries (LeClanche)
Capacity 6,5 MWh
2x10 battery strings @ 327 kwh
8 battery rooms

*TEU = Twenty-foot equivalent unit

Open Hatch Container Feeder - fully battery powered solution

Link til video
Original operational area and vessel schedule

- Daily shipments to Brevik or Larvik, fixed schedule
- Herøya – Brevik: approx. 7.5 nm: 1h
- Herøya – Larvik: approx. 30 nm: 4h
- Loading/unloading: 8 hrs
- Battery capacity sufficient back and forth Herøya-Larvik
Vessel sailed 70 nm from Brevik to Horten

Redundancy and spare emergency capacities – essential for sailing permit
Massterly Remote operation center (ROC)
So, why go autonomous?

**Safety**

75-96% of accidents at sea due to human failor!

30% one third of all groundings occurring between 1994 and 2003 involved an Officer on watch alone on the bridge who was fatigued.

**Cost**

Reduction of maintenance cost as digitalisation allows online surveillance by experts on shore.

Reduced Manning onboard and better scheduled maintenance.

**Future**

In 2040 autonomous vessel level 4 will reach 11-17% of global shipping. I.e. being surveyed from shore based operational centres.
Other green initiatives

HEGRA

Haddock- wind to NH3

NA –catalyst

Electrification of NH3-plant Hydro-power (460 MW)
Joint Venture Statkraft – AKER – Yara

Windmill park in Netherland
Electrification of NH3-plant from wind-power (100 MW)
Joint venture Ørsted- Yara

Catalyst for N2O reduction in Nitric Acid plants