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Nel Hydrogen

Jon André Løkke
CHIEF EXECUTIVE OFFICER

Nel Hydrogen

- Pure play hydrogen technology company listed on the Oslo Stock Exchange (NEL.OSE)
- Manufacturing facilities in Norway, Denmark and U.S. & global sales network
- World's largest electrolyzer manufacturer, with >3500 units delivered in 80+ countries since 1927
- World leading manufacturer of hydrogen fueling stations, with ~50 H2Station® solutions delivered in 9 countries



ALKALINE AND PEM ELECTROLYZERS

Converting water and electricity to hydrogen and oxygen – for industry, mobility and energy purposes



COMPACT HYDROGEN FUELING STATIONS

Hydrogen fueling stations capable of fueling any kind of vehicle. World's most compact – simple to integrate with other fuels & standardized

Strong field know-how & manufacturing capacity



Wallingford, USA

PEM electrolyzers

2,700+ systems delivered

Production capacity:

>40 MW/year



Notodden/Herøya, Norway

Alkaline electrolyzers

800+ systems delivered

Production capacity:

40 MW/year

→ 360 MW/year (> 1 GW/year)



Herning, Denmark

Hydrogen refuelling stations

50+ stations delivered

Production capacity:

300 HRS/year

Sector integration example from Norway

Sector integration in Norway – possible to integrate five large sectors with renewable hydrogen

ELECTRIC GRID



CENTRAL HEATING



INDUSTRY



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AQUACULTURE



MOBILITY

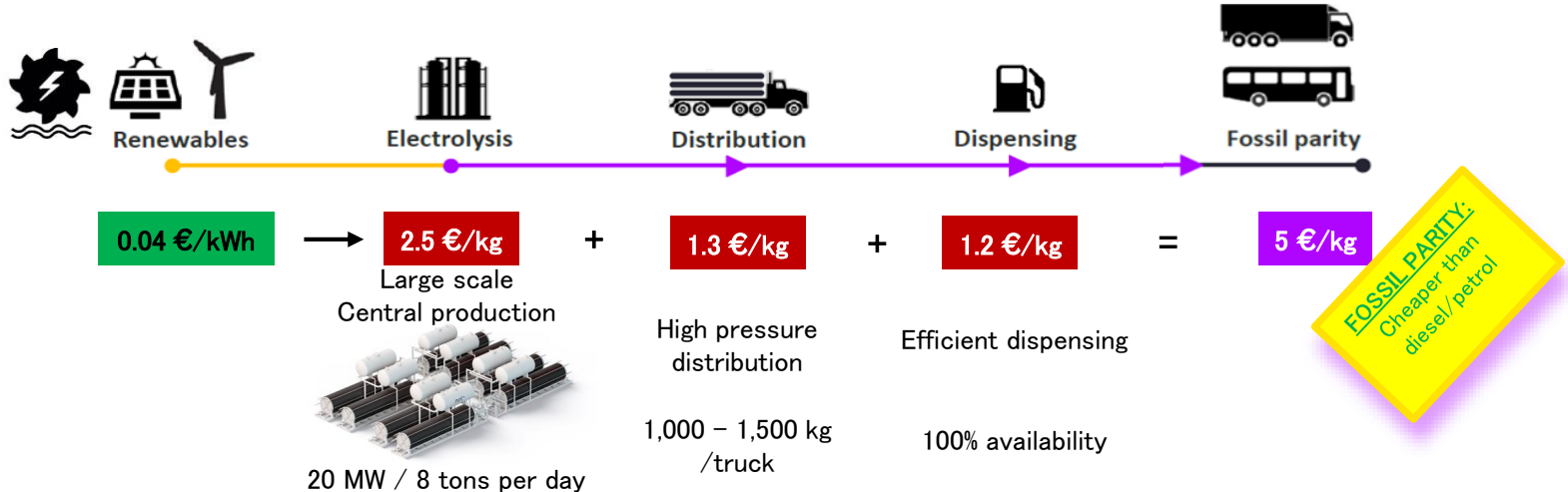


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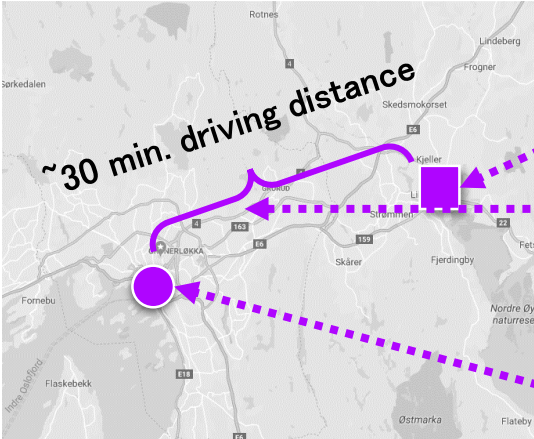
Fossil parity on fuel achievable in Norway today

Centralized production close to power or heat source enables business case

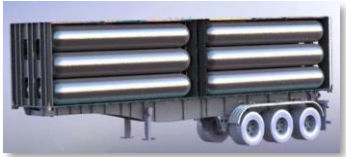
- Regional hydrogen production, use of low cost renewable energy
- Possible to integrate grid balancing services as well as district heating
- Parity with taxed diesel possible already from 4–8 ton per day



H2 distribution example – Akershus Energi have multiple sites along Glomma



Large scale hydrogen production and integration with central heating grid



Trucked-in in pressurized tanks, 500 bar in a 40ft container, 1,300kg of hydrogen



H2Station cars



H2Station buses



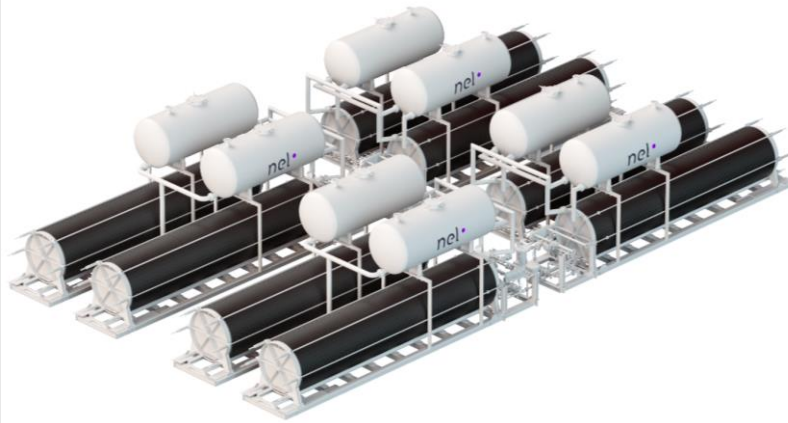
H2Station ferry



Semi-centralized production reduces costs, outcompeting fossil alternatives

- Applying low cost industrial solution to transport applications, driving down cost
- Install an 8-stack electrolyser, produces 8 ton of hydrogen per day at full production – fully scalable
- Offers low cost hydrogen, grid balancing services as well as heat for district heating
- Can produce to and supply multiple applications, bus, truck, car, ferry, train, etc.
- Can support a large number of vehicles within each application

Vehicle	#	Kg/d/unit	Total kg/d
Bus	100	25	2 500
Truck	100	30	3 000
Car	2000	0.5	1 000
Ferry	4	250	1 000
Train	2	250	500
Total (kg/d)			8 000



Hydrogen infrastructure Oslo/Akershus



Akershus Energi

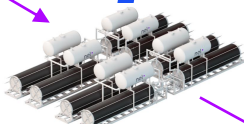
- Grid balancing
- Excess power
- District heating



Glomma, river power



8 ton/day electrolyser



Trucked-in in pressurized tanks
 • 1,000–1,500 kg H2 per trailer



Nikola demo
 1 000 km in 10 min



Buses
 Bekkestua, other



Trucks – Hyundai/SCANIA
 Trucks, forklifts, cars



H2 train
 Kongsvinger–Elverum–Koppang



Passenger vehicles
 Kjørebo, Hvam, Ås, etc.



Fast ferries/maritime
 Oslo/Drøbak



OSL Gardermoen
 Electrification airport
 internal traffic



Hydrogen supply from semi-centralized production

Central large scale production (H2Hub), distribution and fueling

Green hydrogen Production:

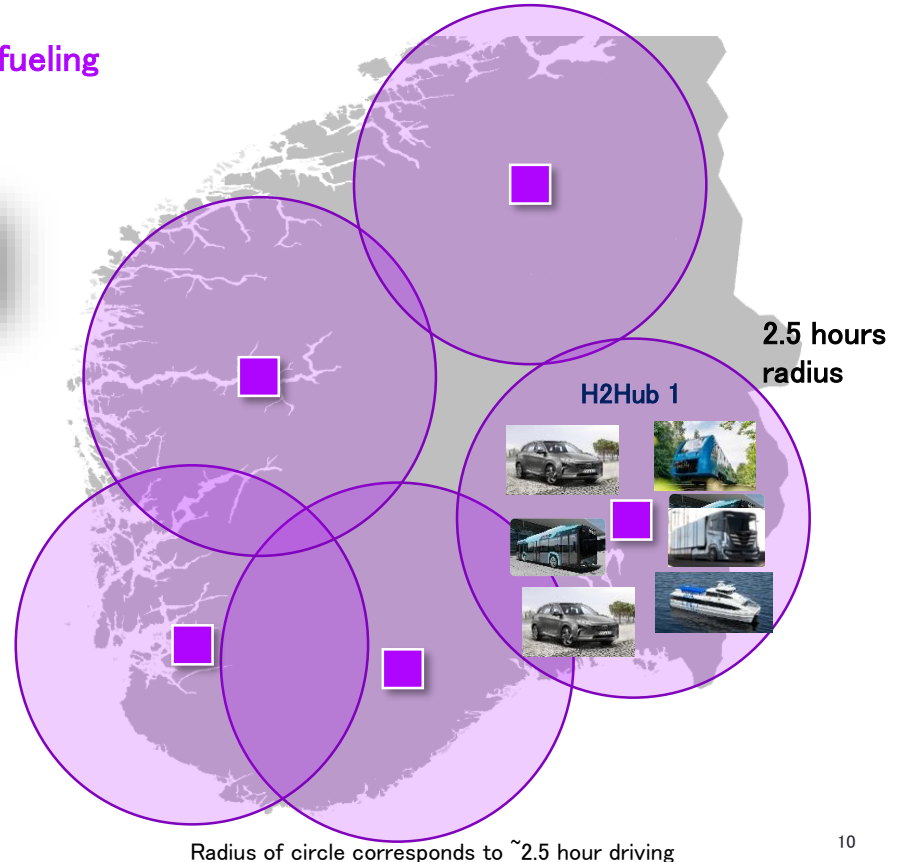
- 8 – 24 tons / day from Hydro/Wind

Efficient hydrogen distribution:

- 1,000–1,500 kg pr. truckload

Efficient hydrogen distribution:

- 2.5 hour travel distance for optimal distribution cost
- H2Station capacity can easily be added or expanded
- Fuel with 100% renewable hydrogen at attractive price



Next generation green fertilizer manufacturing plants

Landmark project on green fertilizer initiated

- Project for developing next generation green (renewable) ammonia and fertilizer production supported by the PILOT-E program
- Nel role in project: developing next generation alkaline electrolyzer
 - Tailored for large scale hydrogen production for industrial applications w/direct connection to renewables
 - Development targets: lower unit cost, higher level of flexibility, higher pressure, lower footprint, equal efficiency to current Nel electrolyzers
 - Electrolyzer for pilot plant will have a capacity of ~5MW
 - Will supply equal to ~1% of hydrogen needed by Yara at Herøya facility
- Ammonia represents >50% of hydrogen market, currently based on fossil sources – significant market opportunity for electrolysis

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Jon André Løkke, CEO in Nel and Tove Andersen, EVP Production in Yara signing the collaboration agreement. Photo: Yara

Developing fossil free steel production in Sweden using green hydrogen

HYBRIT aims to develop fossil free steel production for the future

- Nel has received a purchase order for a 4.5 megawatt alkaline electrolyzer which will be used in a pilot plant for fossil free steel production
- Hybrit Development AB (HYBRIT) is a joint venture owned equally by SSAB, LKAB and Vattenfall
- The steel industry accounts for 7% of global and 10% of Swedish CO₂-emissions
- Pilot plant will operate in Luleå, Sweden from 2021 – 2024, with target of full-scale implementation by 2035
- Steel market opportunity is potentially 3x the size of ammonia



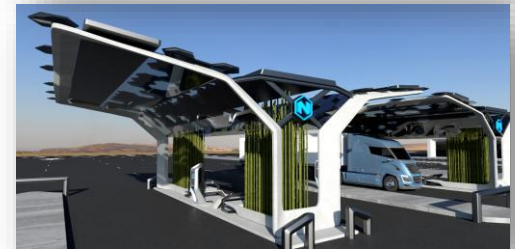
Source: Hybrit Development AB (HYBRIT) is a joint venture owned equally by SSAB, LKAB and Vattenfall

Project examples

Nikola Motor progressing well with the hydrogen truck development

Nel and Nikola = Hydrogen @Scale

- Nel awarded contract as part of Nikola's development of a hydrogen station infrastructure owned and operated by Nikola in the U.S.
 - Multi-billion NOK 1 000 MW electrolyzer and fueling station contract, to be deployed from 2021 – largest electrolyzer contract ever awarded
- Nikola and Nel
 - Nikola producing Fuel Cell Class 8 Trucks at the end of 2022
 - Nikola using Nel technology for 8 tons H₂ / day @ Scale Stations
- Nikola currently has 13,000+ trucks in pre-orders
- Currently developing fueling standard & hardware



Scaling up manufacturing capacity to meet demand

Secured location for low-cost alkaline electrolyzer manufacturing at Herøya, Norway

Alkaline electrolyzer manufacturing plant with possibility to grow beyond 1 GW/year



The new manufacturing facilities are located in Herøya Industrial Park, in a 15,000m² building in one of the largest industry parks in Norway



Possible set-up for 3 production lines at the Herøya facilities

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number one by nature