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Hydrogen in Statkraft

Green H2 at 10 CET

EBH, DECEMBER 2020

Statkraft: Europe’s largest producer of renewable power

Own capacity

19 700 MW

61 TWh → **93%** renewable

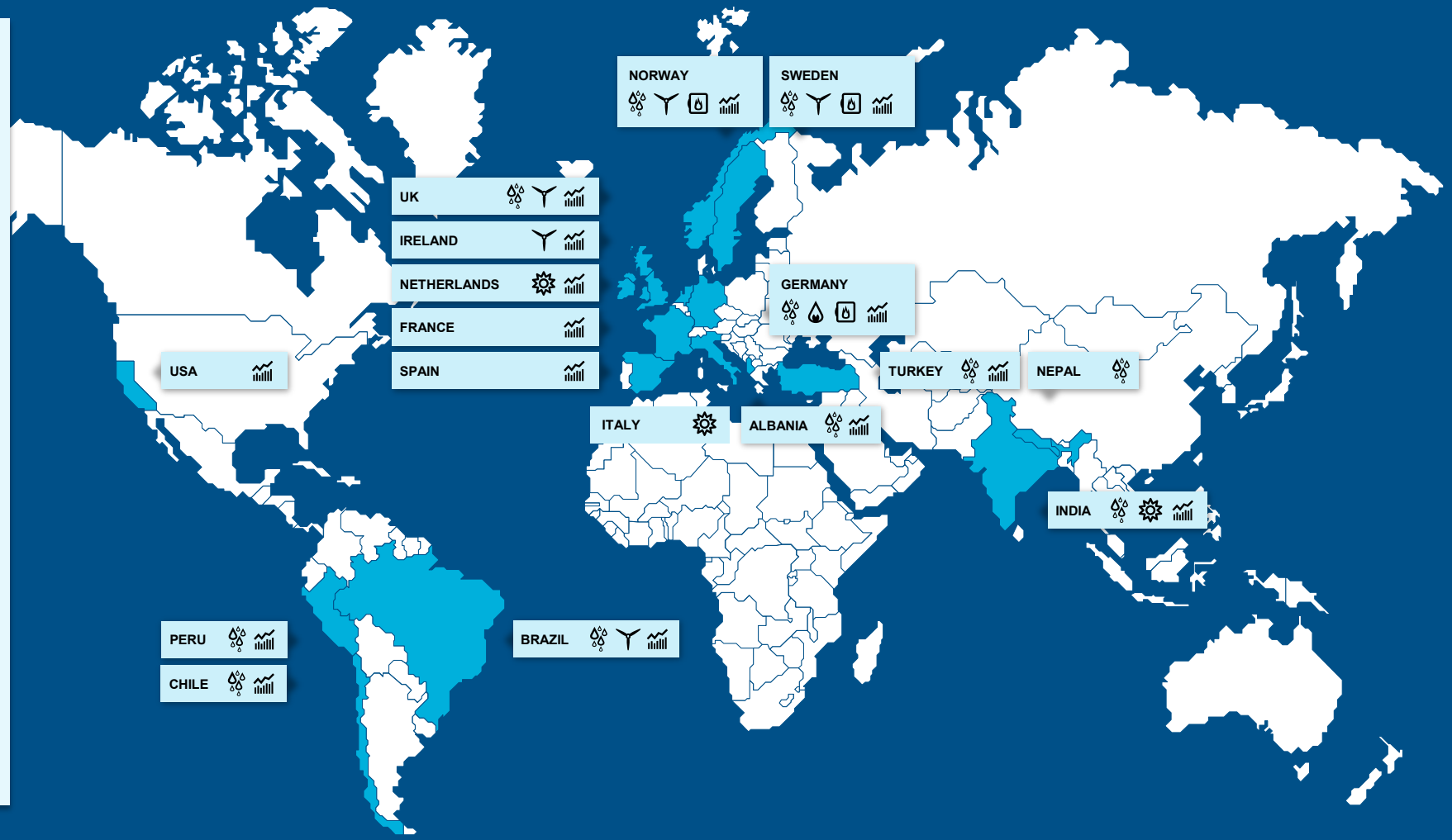
Third party capacity

28 000 MW

100 % renewable

Employees

4 000



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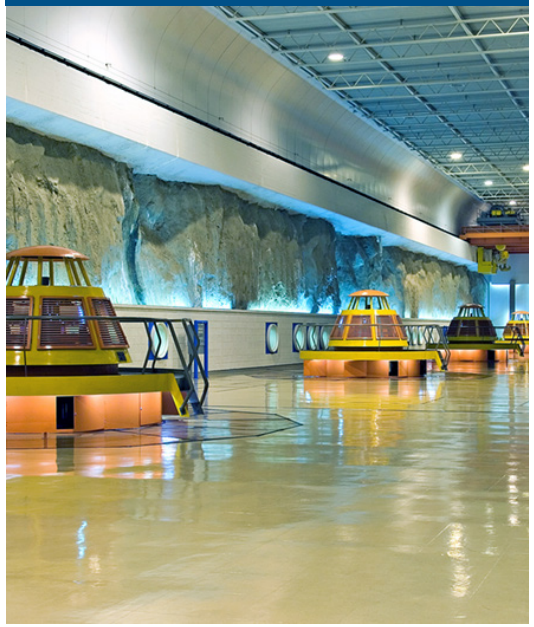
Statkraft's strategy:

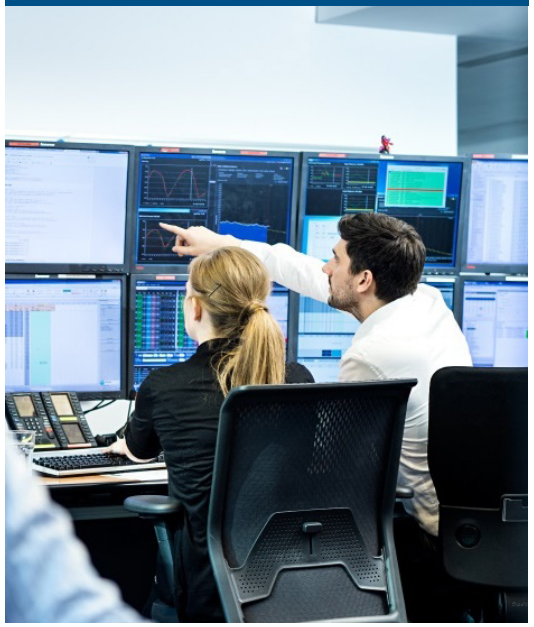
Larger and broader within renewable energy

OPTIMISE AND EXPAND HYDROPOWER PORTFOLIO

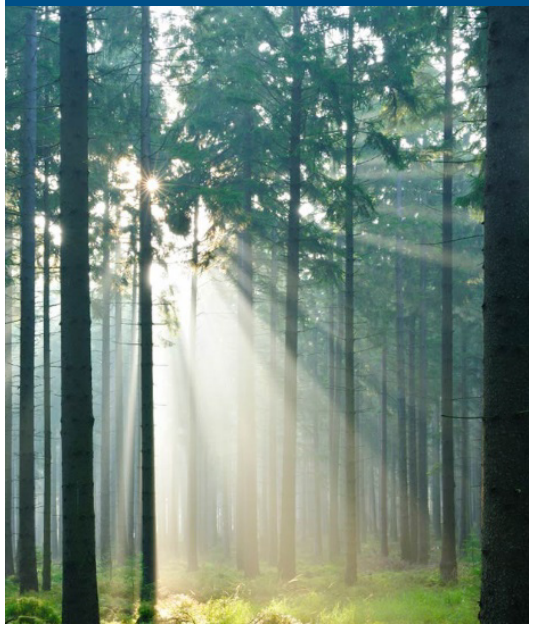


RAMP UP AS WIND AND SOLAR DEVELOPER

GROW THE CUSTOMER BUSINESS



DEVELOP NEW BUSINESS INITIATIVES



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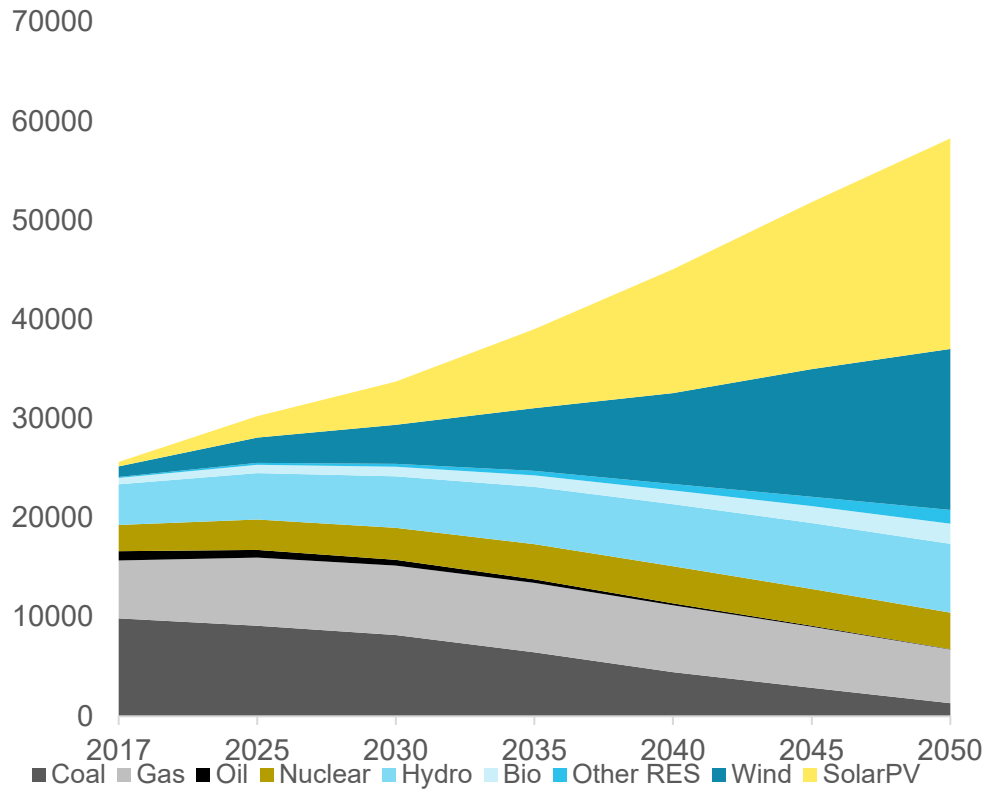
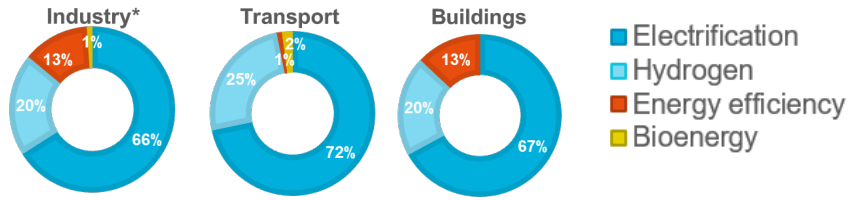
Low emission scenario: more renewable energy, increased electrification and more use of hydrogen

WORLD POWER PRODUCTION, TWh



HYDROGEN APPLICATIONS

- Heavy transport – road and sea
- Industry
  - Feedstock chemical industry (ammonia and methanol)
  - Heating in the steel industry
  - Reaction agent in the steel industry
- Future: Balancing electricity and heating systems



*Source: Statkraft analysis; *Industry includes only energy use, not feedstock*

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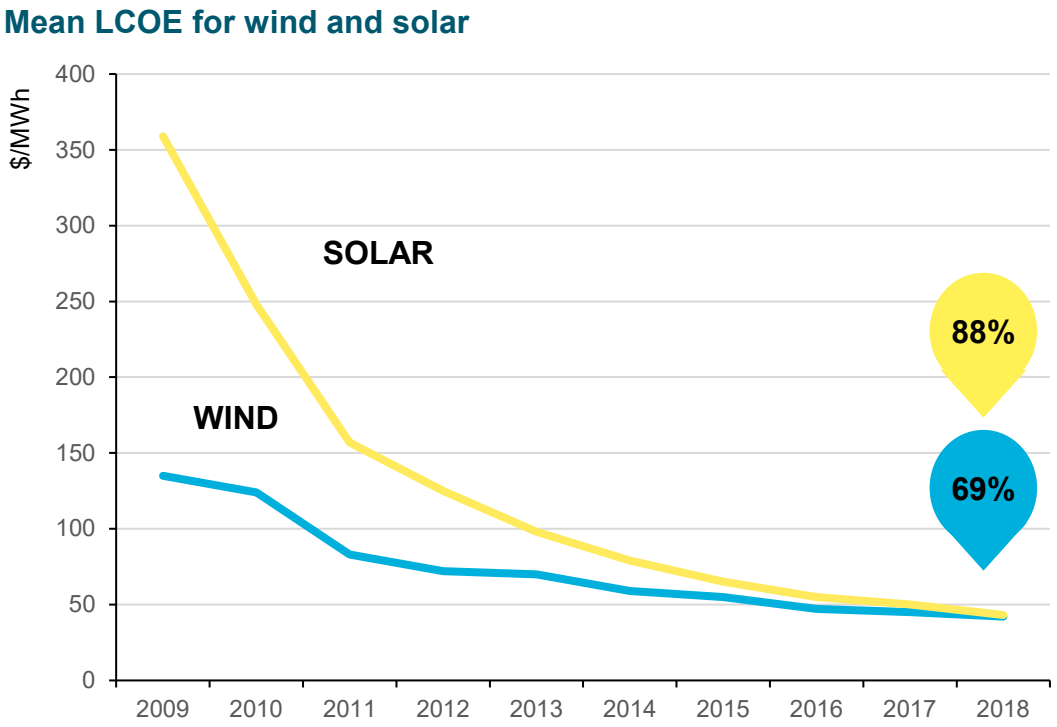
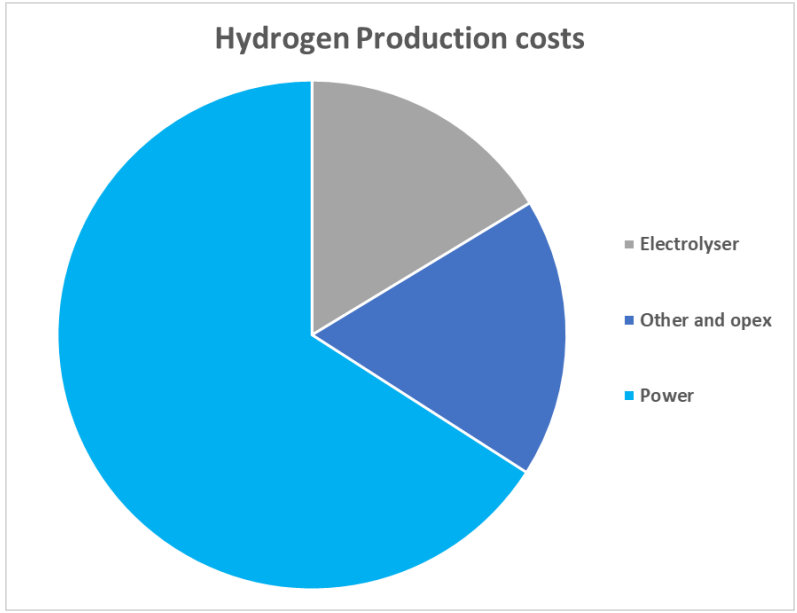
Costs of renewable falling - thus also hydrogen

- Solar down 88%, wind down 69% in 10 years



Source: Lazard. Average of high and low LCOE for each technology.

- Power roughly 70% of the production cost of hydrogen



Source: Statkraft analysis

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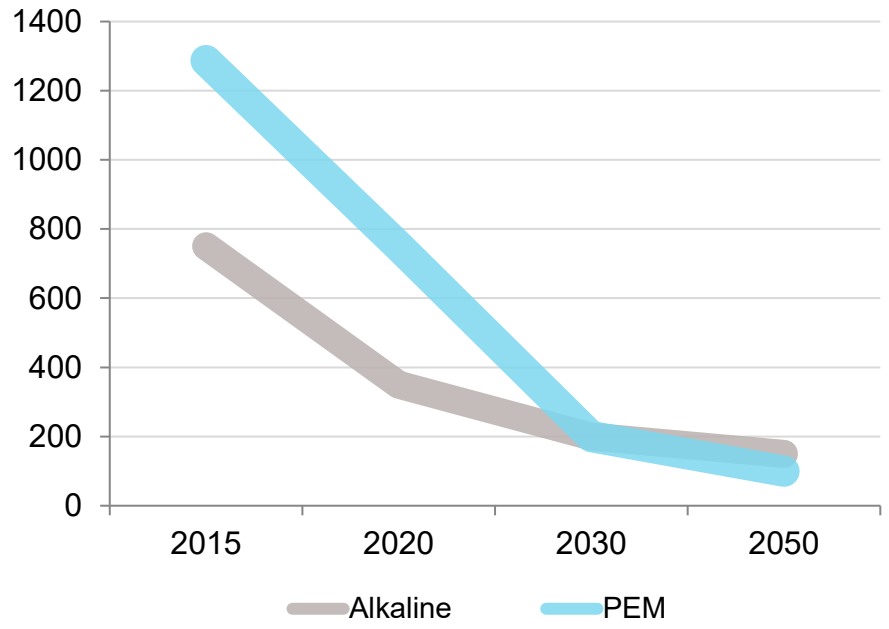
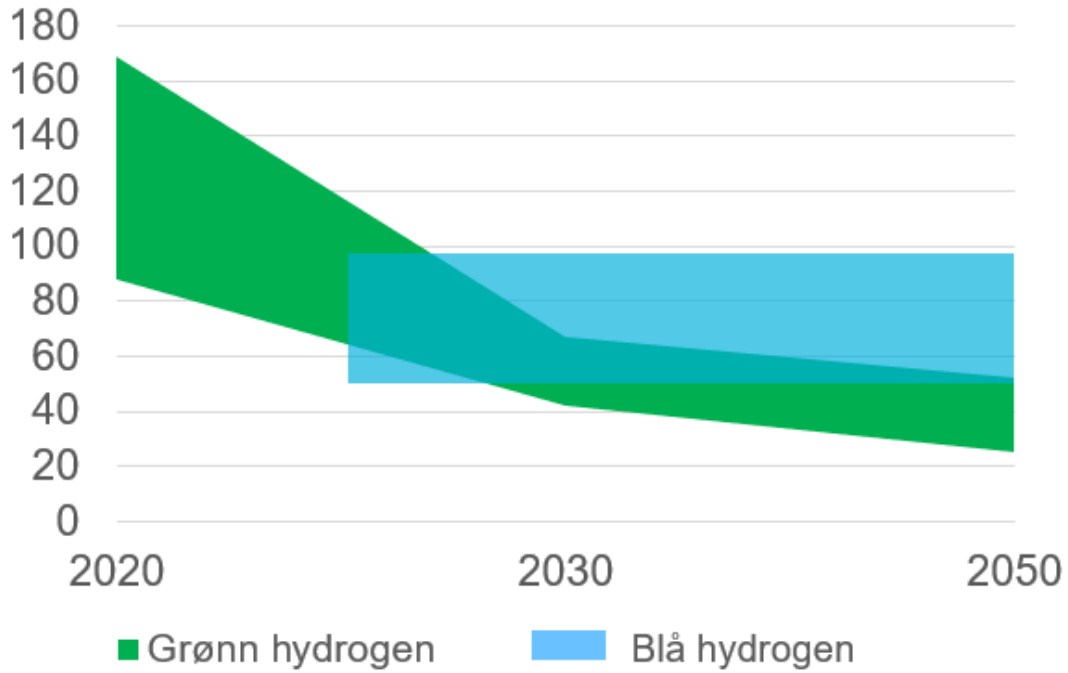
Costs of electrolysers falling, green hydrogen competitive with blue

Electrolyser capex costs (100 MW, EUR/kW)



Total costs for green and blue hydrogen (EUR/MWh)



Kilder: Bloomberg New Energy Finance, IHS, eksterne kilder, Statkraft analyse
Grønn hydrogen: Sol, landbasert og havvind i Europa
Blå hydrogen: Gas SMR med 90% CO2 fangst

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Hydrogen for green industry and transport

Hydrogen can replace fossil fuels for ferries, long-haul marine transport, heavy duty transport and construction

With **storage capacity** significantly higher than batteries, hydrogen may play a key role in future energy systems

Within industry, hydrogen can replace carbon and produce **biofuels**, **e-fuels** and **green chemicals**

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Mo Hydrogen Hub – green steel

Norway

H_2

Initial electrolyser capacity:

40-50 MW

Under planning

Partners:

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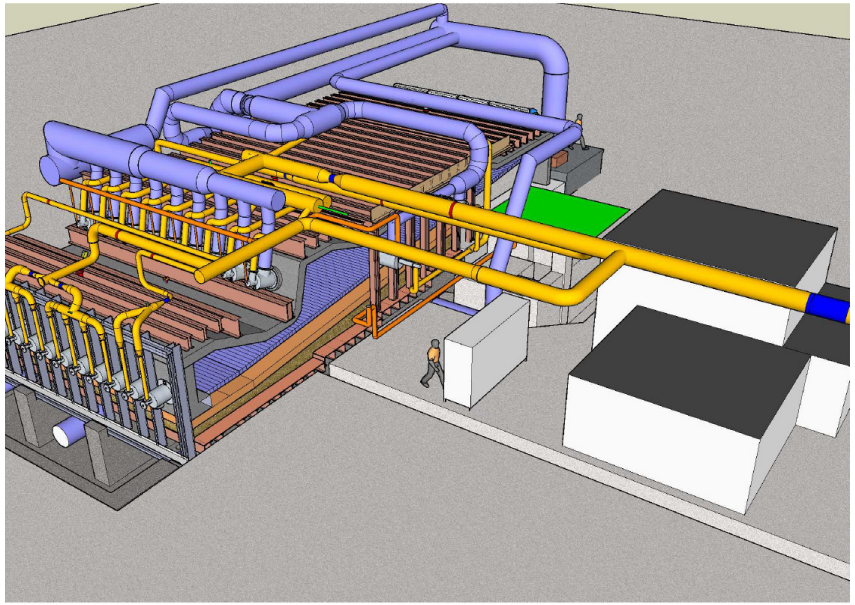
CELSA GROUP | CELSA NORDIC

Mo Industripark as

Planned Furnace Upgrades



- Celsa's steel production consists of two main processes:
  - Melting the steel and casting it into billets in the *Steel Mill*
  - The billets are transported to the *Rolling Mill* where they are heated to approx. 1173 °C, before being rolled out to finished products with different dimensions and qualities

- The Rolling Mill has the potential of reducing its emissions of CO2 by 58 000 tonnes annually by changing fuel to hydrogen
  - Equalling a emission reduction of up to 100 % compared to the current fuel mix

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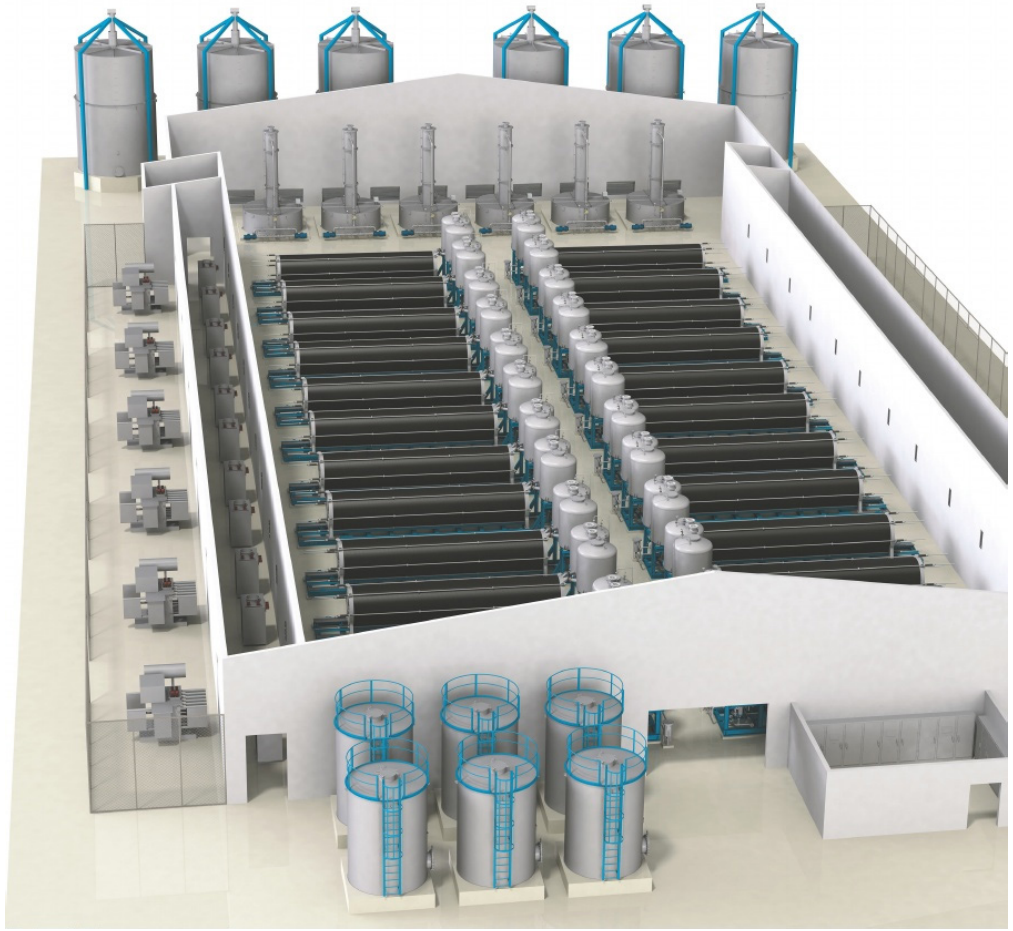
Electrolyser Plans

- Install a 50 MW alkaline electrolyser plant. Planned to be in operation from Q3 2023.

- The electrolyser performance in this projected is designed to perform beyond today's industry leading standard:
  - Improved power consumption => lower OPEX
  - Lower CAPEX
- Additionally, it will provide opportunities to improve the manufacturing process to make it more efficient



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Green methanol at Finnfjord

Norway

H_2

Electrolyser capacity:

140 MW

Under planning

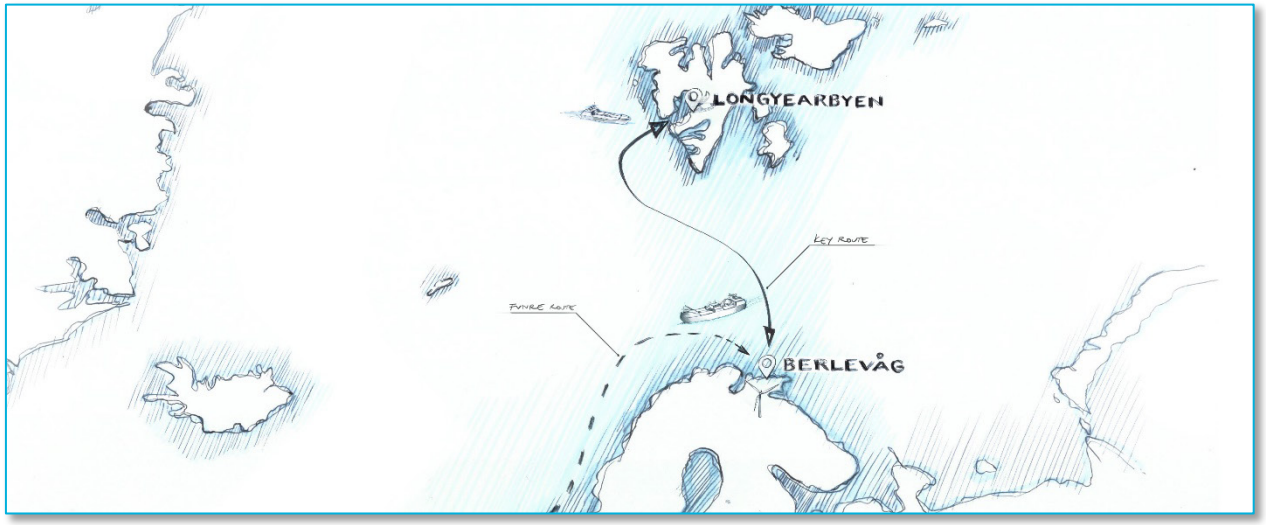
Partners:

Statkraft

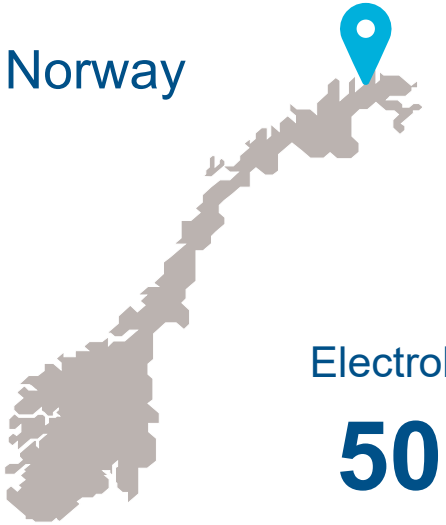
CARBON RECYCLING INTERNATIONAL

FINNFJORD

ZEEDS and Varanger: Green ammonia



Norway



H_2

Electrolyser capacity:

50+ MW

Under planning

Partners:

VARANGER KRAFT

AkerSolutions

WÄRTSILÄ

Store Norske

GRIEG STAR

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