

# HAEOLUS - green hydrogen produced in Berlevåg, Norway

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# Location

Both the wind park and hydrogen plant are located near to Berlevåg, Norway, well within the artic circle. Winds are strong there and the city which is a fishing hub has a harbor that can service ships.



# Companies involved

Here are some of the companies that are directly involved

- ① Varanger Kraft - Power company, municipal owned
- ② Cummins - Electrolyzers
- ③ Hydrogenics - Hydrogen and fuel cells (quired by Cummins)

indirectly involved companies include Siemens, who built and maintain the wind turbines, as well as companies that did the yield assessment for the wind park or that are involved in the investment.

# About the wind park

- ① Wind park in east Finnmark with 45MW capacity
- ② A single turbine has about 3MW capacity
- ③ Finnmark is an energy rich region with hydro power and lots of arctic wind



# About the wind park

- ① Due to political reasons, concessions for new plants are rare and valuable
- ② There are plans to expand the park to 200MW capacity
- ③ The Norwegian power grid is not able to transport that energy to the south; therefore it needs to be utilized up in the north



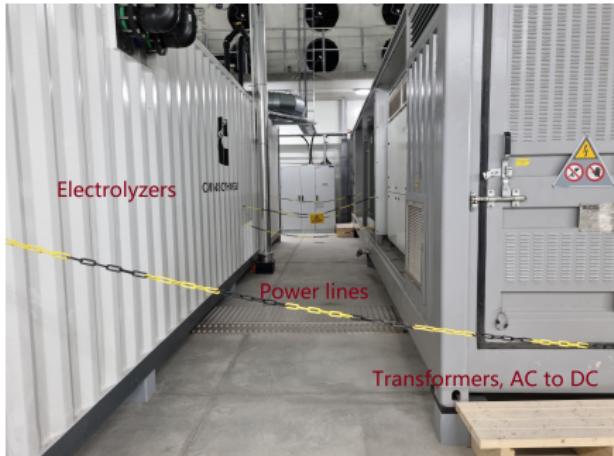
# About the hydrogen plant

- ① Haeolus project funded by European Union
- ② Production of green hydrogen from artic wind power
- ③ Research there includes control algorithms to optimize the utilization of available wind power



# About the hydrogen plant

- ① Three containers in the plant: Transformers, electrolyzers and fuel cell
- ② Power is generated primarily at the wind park
- ③ Electrolyzers have 2.5MW capacity



# About the hydrogen plant

- ① Fuel cell is rather small to avoid having the plant be regulated as a power producer
- ② There are infrared cameras and gas sensors to detect hydrogen leaks
- ③ Electrolyzers are operated mostly remotely with the occasional need for on-site maintenance

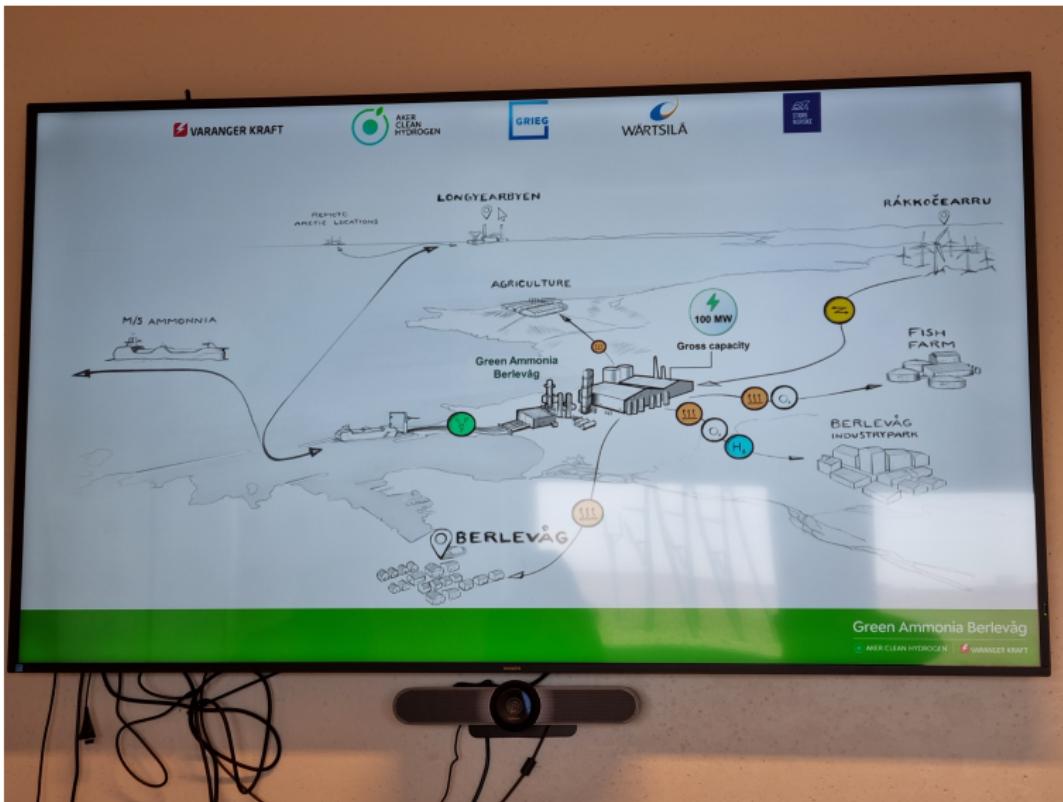


# About the hydrogen plant

- ① Hydrogen is stored uncompressed in an outside tank
- ② There are plans for expansion which include 700bar tanks and compressors
- ③ Unlike the tank, the containers need to be housed because of the extreme weather (winter) in Finnmark



# Plans for expansion



# Plans for expansion

- ① 100MW Ammonia plant next to the current hydrogen plant
- ② Develop more use cases / consumers for the e-fuels
- ③ Eg. the Berlevåg region has many fishing industries, they and commercial shipping industries can be consumers for the e-fuels



# Additional challenges

- ① Indigenous people and their reindeers are disturbed by the wind park
- ② Finnmark regions suffers from young people leaving to live in the south
- ③ Weather can be quite extreme (eg. there often is trouble with fog and air travel)



# References

- ① Haeolus project website <https://www.haeolus.eu/>
- ② Varanger Kraft, <https://www.varanger-kraft.no/hydrogen-1/>
- ③ Cummins Hydrogen,  
<https://www.cummins.com/new-power/technology/hydrogen-generation>