

# Best Practice Examples - FINLAND



## Background

Oy Woikoski Ab has a long distribution on chemical industry in gas production in Finland. The company was established in 1882, with over 200 agents in Finland and 13 operator plants and offices, the annual turnover of the company is around 25 million EUR. The company has a huge share in industrial basic gases production (e.g. Ar, Acetylene, Nitrous oxide, Oxygen, odourised oxygen, Helium, Carbon dioxide, Propane, Compressed air, Nitrogen and Hydrogen) as well as food and beverage gases (extending foodstuffs life in shelves by MAP technique which fills protective gas inside a package).

Moreover, company produces specialty gases for various fields and different industrial applications which includes welding machines and equipment. Woikoski Medical collaborates with health care and medical segments by supplying gases and relevant equipment. High-quality equipment for oxygen therapy is offered by Woikoski to improve life quality for all ages and any need or situation in which the guidance is provided for the safety of the users (WOIKOSKI, 2017). With three sales regions in Finland (Northern Finland, Central Finland, Southern Finland), the company tries to improve their services to the customers for fast and direct delivery services and to work more efficiently.

## Focus area:

- by-product hydrogen
- 300 bar gaseous hydrogen buffers
- Hydrogen and liquid oxygen
- Ammonia
- H<sub>2</sub>O<sub>2</sub> production
- Desulfurizing
- Fuel Cell activity
- Liquid hydrogen

## Woikoski has been actively involved in several Hydrogen projects over the past decade as follow:

- *PEM Beyond (3.5 years EU project 5/2014 –10/2017):*
  - Coordinated by VTT Technical Research Centre of Finland, 5 European partners (<http://pembeyond.eu/index.htm>)
  - The aim was to make a roadmap for volume production
  - Reforming of crude bioethanol
  - H<sub>2</sub> purification
  - Power generation in PEMFC system



- *LOHCNESS (2 years Finnish project 5/2017 – 4/2019):*
  - Coordinated by VTT Technical Research Centre of Finland, University of Helsinki, Fortum, St1, Woikoski, Leppäkosken sähkö, Aino Energia (<https://www.vtt.fi/sites/lohcnness/>)
  - The aim was to evaluate the feasibility and performance of the LOHC solutions and long-term durability of the LOHC fuel cell installation
  - Liquid hydrogen "batteries" for storing renewable energy
  - Purity of the released hydrogen



- *HySTOC (3 years EU project 1/2018 – 31/12/2020):*
  - Coordinated by Hydrogenious LOHC Technologies GmbH, HyGear B.V., HyGear Fuel Cell Systems B.V., HyGear Technology & Services B.V., Woikoski, VTT, University of Erlangen-Nuremberg (<https://hydrogeneurope.eu/project/hystoc>)
  - The aim is to demonstrate LOHC-based distribution of high purity hydrogen (ISO 14687:2-2012) to a commercially operated hydrogen refueling station (HRS) in Woikoski, Finland, in an unprecedented field test.
  - In the long term, the LOHC technology developed within HySTOC will allow integration of renewable energy by making it available to hydrogen mobility in an easy-to-handle form and will thus help decarbonize the world.

