



STORK & HYDROGEN

How Stork supports the energy transition through the hydrogen distribution network

HYDROGEN FOR RESIDENTIAL USAGE

This is all about taking hydrogen from the production facility to residential end-users, allowing them to heat their water boiler with hydrogen instead of gas. Typically the gas infrastructure exists and naturally the wish is to use as much of this existing network as possible.

How Stork has supported this:

- Stork is providing overall management oversight to switch over to hydrogen for residential heating in the municipality of Hoogeveen, The Netherlands
- Stork is also involved in municipalities of Alkmaar, Nieuwborgen and Borger Odoorn.

HYDROGEN FILLING STATIONS

This is the last part of a hydrogen network, to get the hydrogen into vehicles. Typically municipalities of large cities will be first movers, as this allows them to switch from diesel-driven busses and garbage collection trucks to hydrogen-driven vehicles, thereby greatly reducing CO₂ in their cities.

Why would Stork be interested in this? These filling stations contain 350/700 bar compressors that need maintenance and lots of valves that need calibration. Apart from the fact that we have the experience to all that, doing calibration would allow Stork to put a Stork sticker on these facilities ("Calibrated by Stork"), creating fantastic marketing of Stork has a player in the hydrogen industry.

How Stork has supported this:

Air Liquid fueling stations in Zaventem (Belgium) and in Rhoon (Netherlands)

- Unmanned H₂ filling stations suitable for filling 350 and 700 bar for private and business cars, buses, taxis and trucks
- We provides calibration, preventive & 24/7 corrective maintenance services related to E&I, valves, safety devices and high pressure compressors since 2014
- Also maintain condition of the stations itself
- We also provide guided tours and support new customers
- In 2022 Air Liquid decided to internalize maintenance and the contract was terminated.

PitPoint fuel station in Groningen (Netherlands)

- Containerized station, operated & maintained by PitPoint)
- All E&I and mechanical connections were made by Stork – 2020

HYDROGEN BURNER ON AIR

Stork has been manufacturing these for decades as hydrogen is often one of the many components in waste streams that get routed to waste heat boilers.

HYDROGEN BURNERS ON PURE OXYGEN

This is an alternative solution to avoiding NO_x production. Stork is currently getting ready to trial such a burner to better understand flame behavior, turn-down ratios and other characteristics. The burner parts have been 3D printed and trials started in Q4 2021.



PROJECT EXAMPLE: GAS-OIL SUPPLEMENTARY BURNERS FOR HEAT RECOVERY STEAM GENERATOR

PROJECT INFORMATION

Manufactured and installed a multi-fuel burner in a heat recovery steam generator in a refinery in Turkey, allowing the facility to flexibly burn – depending on availability – natural gas, refinery gas and/or waste oil streams. The refinery gas could contain up to 75% hydrogen. The burner was compliant with local emission requirements for all fuels. It could operate (with flying take-over) between Turbine Exhaust Gas - TEG mode (65 MW) to fresh air mode (115 MW).

PROJECT RESULT

- Flexibility firing multiple fuels, depending availability of fuels at site: Natural Gas, Refinery Gas + Waste Oil.
- Result compliance with the local emission requirements for all fuels.
- Reliable change of operation mode Heat Recovery Steam Generator, TEG mode to Fresh Air mode.