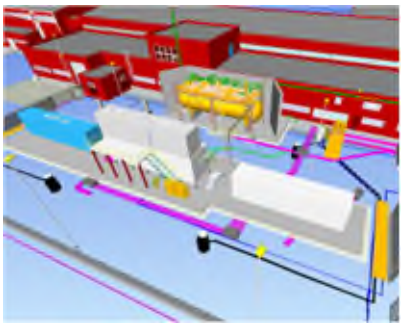


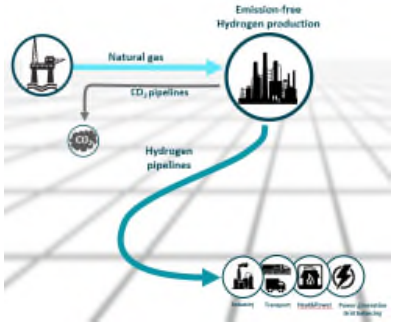
Høyanger Hydrogen Pilot Project

Client: Hydro Energi 2020 – ongoing

Green hydrogen can replace fossil energy in the recycling of aluminium, enabling zero-carbon aluminium products. In a three-year industrial scale pilot, Hydro will test green hydrogen technology in the new recycling unit at Hydro Høyanger, Norway.

RENE is engaged through the Hydro Framework Agreement providing owners engineer services to the Hydro project team. RENE covers the following Engineering services:

- Process
- Piping & Layout
- Mechanical
- Material
- Technical Safety



Large Scale Low Carbon Hydrogen Production from Natural Gas

2024 – 2025

Screening study of technology intended for Large Scale Low Carbon Hydrogen Production from Natural Gas. The goal is to develop a hydrogen value chain to provide Europe with blue hydrogen produced at the southwest coast of Norway, based on Norwegian natural gas.

The project performed a technological evaluation of a large-scale blue hydrogen production plant, benchmarking the available reformer technologies for low-emission production (ATR, GHR-ATR and POx) with regards to:

- Energy efficiency
- Steam and oxygen consumption
- CO2 emission and capture rate
- Electricity consumption
- Technology Readiness Level
- Single-train production capacity
- CAPEX costs

Green Hydrogen Mosjøen, Gen2 Energy

Client: Fichtner / Mitsui 2023 – 2024

Technical due dilligence of Gen2 Energy green hydrogen plant in Mosjøen.

The plant is planned for production of hydrogen and export to Norway/Europe with pressurized containers transported by ship RENE performed a technical Due Dilligence as a part of Mitsui investment evaluation process.

RENE supported Fichtner with competence in technical safety and permit process

ILF Guhlen Project

Client: ILF / 45-8 energy 2023

Study to develop a blue hydrogen plant based on GHR-ATR technology combined with cryogenic separation of CO2 and PSA at an Eastern German location.

RENE has identified and described the main process components and the plant size and cost for production of hydrogen with a high degree of CO2 capture.

The scope of work covered:

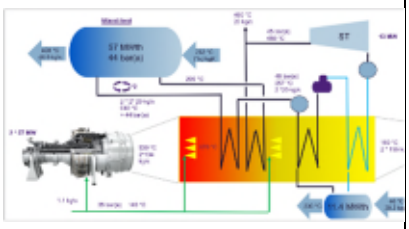
- Description of the process facilities required to produce H2 from natural gas.
- Definition of the main components of the plant with approximate size and CAPEX.
- The study was based on RENEs process simulation model and experience from previous work.
- Description of the main utilities required (electric power, steam and cooling systems) showing thermal efficiency and power requirements.
- Overall description of the main concept with indicative area and CAPEX.

Hydrogen Compressor study

Client: Gassco 2022

As a partner in the Joint Industry Project Low Carbon Energy Hub Gassco is investigating technical solutions for pipeline export of hydrogen, both blue and green, from large scale production.
This study focused on finding suitable compressor solutions for large scale compression of hydrogen for pipeline transport. Any technology gaps and limitations were identified as well as any step changes in technology.

- The main components of the plant were described and identified with approximate size, weight, and CAPEX.
- Possible and realistic further developments in compressor technology was described
- The main utilities required (electric power and cooling systems) was described showing thermal efficiency and power requirements.
- Overall description of the main concept with indicative area, weight, and cost
- The Study included layout sketches of the plant, system description and general flow diagrams.



Integrated Combined Heat & Power Concept
Client: Internal
2022

REINERTSEN New Energy (RENE) and Siemens Energy has performed an internal study to find a solution where a blue hydrogen production plant can be made self-sufficient and generate its own clean power supply.

- The developed concept is based on close integration of gas turbines with a blue hydrogen production plant
- Hydrogen from the production plant is utilized as fuel to avoid CO2 emissions and the need for flue gas CO2 capture
- The gas turbines are utilized in a CHP concept to obtain high efficiency
- The RENE / Siemens concept utilizes a Heat Recovery Steam Generator with supplementary firing to generate steam
- The generated steam is supplied to the process and used to provide front-end heating of the feedstock to the plant
- Supplementary firing provides flexibility with respect to steam generation and balancing power generation and steam generation

Production of green LH2 for ferries (Vestfjorden)
Client: Gasnor
2021

Engineering Services related to production facilities for green liquefied hydrogen.

The work also comprised review and verification of design bid documents, review of system interfaces and overall system design.

Blue hydrogen from LNG
Client: Hoegh LNG
2021

Study for production of blue hydrogen based on gasified LNG.

The HyProZero process for production of blue hydrogen with CO2 capture was described with PFD's, MEL, layout and a rough cost estimate.

The possible benefits of integrating the LNG gasification process with production of blue hydrogen was also studied.

Hydrogen – ship-based solution – LOHC

Client: Gasnor

2020

Early phase study evaluating LOHC for 'Grønt Skipsfarts-program' - LOHC = Liquid Organic Hydrogen Carrier

LOHC is a secure method for storing hydrogen but requires large amounts of energy for releasing the hydrogen from the carrier.

Evaluation of maturity of the technology, and possibilities and consequences of installing such a facility onboard a bulk vessel of approx. 4000 tonnes

Blue Hydrogen production at Tjeldbergodden Methanol plant

Client: Equinor

2019

Feasibility study to describe a blue hydrogen production plant based on GHR- ATR technology from Johnson Matthey. The capacity of the pilot-plant was in the range of 1.5 t/hr.

The study included integration with the existing methanol plant as well as definition of all equipment. A preliminary layout was developed together with cost and schedule for the plant.

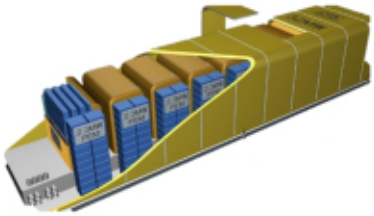
Large scale offshore and onshore blue hydrogen plants was also studied during same project.

Hydrogen market study

Client: Gassnova 2018

The objective of this study was to identify the most interesting geographical markets for blue hydrogen production from natural gas with CCS, and for associated hydrogen / CCS technology.

The study was mostly based on:
- Hydrogen Councils rapport «Hydrogen Scaling up», 2017.
- IEA, World Outlook Report, December 2017
- Markets & Markets Hydrogen Generation, 2017



Clean Highly Efficient Offshore Power Carbon Capture – (CHEOP-CC)

Client: CRM Prototech 2017/18

Study to define a membrane separation unit for integration in the Prototech concept for energy production for offshore applications based on fuel cell technology (CHEOP-CC).
The system is based on steam reforming of natural gas with continuous hydrogen separation across the hydrogen separation membrane.

The hydrogen is used as fuel for HT-PEM fuel cells, and the remaining carbon-rich gas is used as fuel for SOFC, which generates heat that can be used to drive the reforming process.

A Palladium based H2 membrane is used to separate ~70% of the hydrogen for the HT-PEM system which is one of the key features for the overall mass reduction compared to a standard SOFC system. Subsystem requirements as well as cost analysis was included in the study.

Development of palladium membranes

Client: Hydrogen Mem-Tech 2011 - 2022

Technical support and design at all levels for development and testing of Pd-membranes for purification of hydrogen from syngas.

TBO hydrogen production and CO2 capture

Client: Gasnor 2017

Small scale capture and production of hydrogen from existing systems at the Tjeldbergodden methanol plant. Definition of process facilities including CCS and estimation of cost and schedule (CAPEX and OPEX).

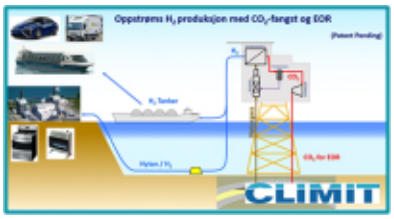
The study also included identification of potential local hydrogen market including required volumes

Production of blue hydrogen from LNG

Client: Gasnor 2016/17

The goal of this feasibility study was to define and describe a process plant for production of blue hydrogen to the TIZIR plant based upon LNG supplied to the site. The hydrogen shall replace coal in the industrial process at Tizir, Tyssedal.

The objectives have been to identify potential showstoppers related to economical, technical or safety aspects. A rough estimate of the capital costs and operational costs was made to provide an indication of the project cost.



Offshore hydrogen production

Client: Gassnova 2015 & 2018

Study to evaluate the feasibility of offshore emission free hydrogen production with CCS.
The study covered:

- impact assessment for existing and new offshore platforms
- evaluation of suitable technology
- safety aspects of production and use of hydrogen offshore

Compressor Technologies for Hydrogen Pipeline Distribution

Client: Internal study 2020

Detailed appraisal of mechanical, non-mechanical and hybrid compressors.
The screening considered advantages and disadvantages related to commercial availability of the technology. Consideration of CAPEX, OPEX, efficiency and equipment footprint size were also included in the screening.
Material selection, testing and verification was highlighted as one of the critical topics.

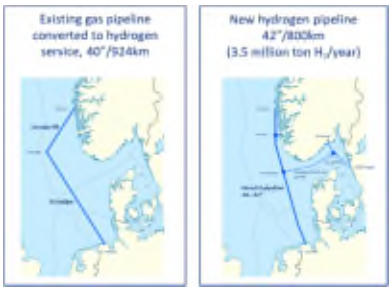
Emission-free production of blue H2 (HyPro-Zero)

Client: Internal study 2019 - 2023

Internal study to develop a cost-efficient process for production of hydrogen from natural gas focusing maximum carbon capture rate and minimizing the CAPEX.

The HyPro-Zero process is filed for patenting and have been presented on several international conferences: ERTC 2019 and 2020, First Element Conference 2021, Europen Gas Conference.

HyPro-Zero is later expanded to be self-sufficient on electrical power and to include the production of Ammonia.

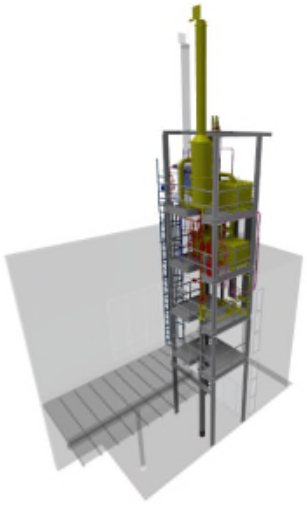


Gas pipelines for efficient hydrogen transportation

Client: Internal study 2020

Internal study to determine the feasibility and cost of exporting hydrogen to Europe through existing gas pipelines, or through new H2 pipelines.

The study covered pipeline material and design aspects to accommodate H2 transport including evaluation of existing standards, rules and regulations.
The study also established the CAPEX and OPEX of the different alternatives.



CO_2 vertical flow test rig

Client: SINTEF w/Equinor & Total 2019

Engineering, procurement, construction and installation of a fully integrated test-rig of a vertical flow circuit to be used for verification and testing experiments with CO2.

The rig comprises an 80 m deep well with a U-tube made of two vertical tubes (large and small diameter) installed inside the casing. The U-tube outside temperature is controlled by circulating a heating fluid inside the well casing. The U-tube arrangement is connected to an existing horizontal test rig for supply and return of the CO2. Arrangements for heating and/or cooling of the fluid is included in the design.