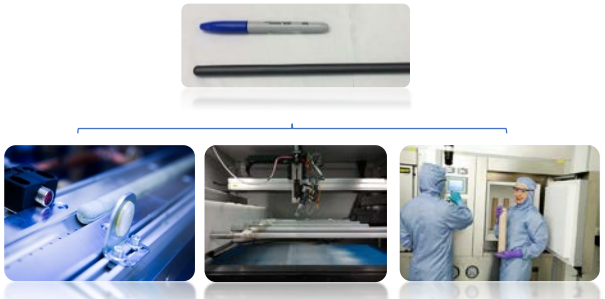
Activities

The work in GAMER comprises:

- Optimisation of cell design and key enabling technologies (seals, interconnects, manifolds)
- Industrial pilot production of tubular cells



- Design and engineering of a pressurized 10 kW electrolyser
- Installation, commissioning and testing of the electrolyser
- Process design, LCA and techno-economic evaluation of the electrolyser integrated in CO_2 to liquid fuels/chemicals plant
- Dissemination and exploitation

www.sintef.no/gamer

The project

GAMER is a European research project co-financed by the European Union's Horizon 2020 research and innovation program and the Fuel Cells and Hydrogen Joint undertaking under grant 779486.

The project gathers 7 partners:

- SINTEF AS (coordinator) (Norway)
- CoorsTek Membrane Sciences AS (Norway)
- Agencia Estatal Consejo Superior de Investigaciones Cientificas (Spain)
- CRI EHF (Iceland)
- University of Oslo (Norway)
- MC2 Ingenieria y Sistemas SL (Spain)
- Shell Global Solutions International BV (The Netherlands)

Duration: 01/01/2018 to 31/12/2020

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GAMER

Game changer in high temperature steam electrolysis with novel tubular cells integrated in a 10 kW module for pressurized hydrogen production

Goal

GAMER will design, build and operate a low cost 10 kW electrolyser delivering at least 30 bar dry H_2. The electrolyser system will use standard industry components for balance of plant (BoP) and operate for 2000 hours in a relevant environment.

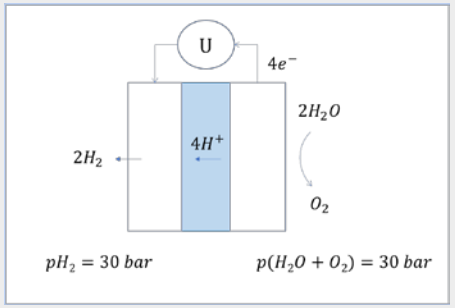
Breakthroughs

- Use of proton ceramic electrolytes
- Novelties in both cells and materials designs
- Low cost manufacturing using solid state reactive sintering route and mass manufacturing capabilities
- Compact design

Concept

GAMER uses proton ceramic electrolyte transporting protons to produce directly dry undiluted hydrogen with high system efficiency.

Protons, moving with a smaller activation energy than oxide ions, enables operation at 400 – 700 °C, which is beneficial for efficient thermal coupling with renewable or waste heat.



Proton ceramic electrolysers have the benefit of a high pressure of high purity hydrogen balanced with the sum of steam and oxygen.

Process integration

Efficient thermal management by coupling of electrolyser system with renewable or waste heat sources and steam