HyTechonomy - Hydrogen Technologies for Sustainable Economies

Objective

Renewable hydrogen can be used to decarbonise industry, energy and mobility and can decouple energy production and usage in location and time. The goal of the project is to make a significant step in the development of key hydrogen technologies from hydrogen production, over storage, to usage for mobility or energy applications. The work concentrates on significant cost reductions as well as lifetime extensions by investigating and mitigating degradation mechanisms in key components.

Innovation

The COMET-project consists of 6 sub-projects, each dealing with specific technologies and specific challenges. By intensive exchanging of knowledge between the sub-projects the synergies and lessons learned can be shared effectively and boost the development of electrolysers, storage systems and fuel cells applications. The sub-project HyLife is focusing on the degradation and its testing methods for PEM Fuel Cells for automotive applications.

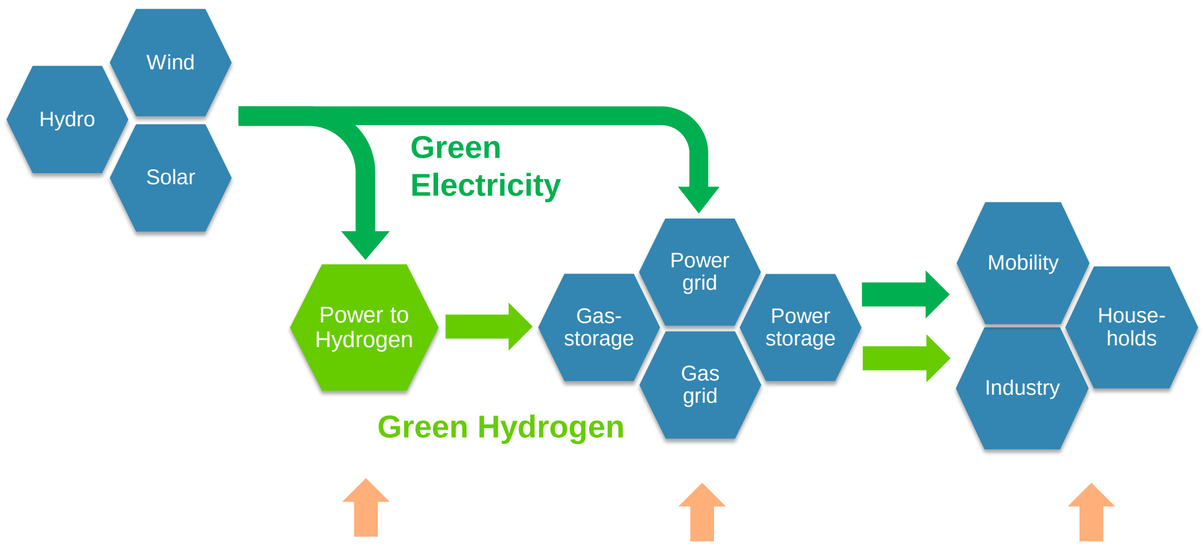
Key Facts

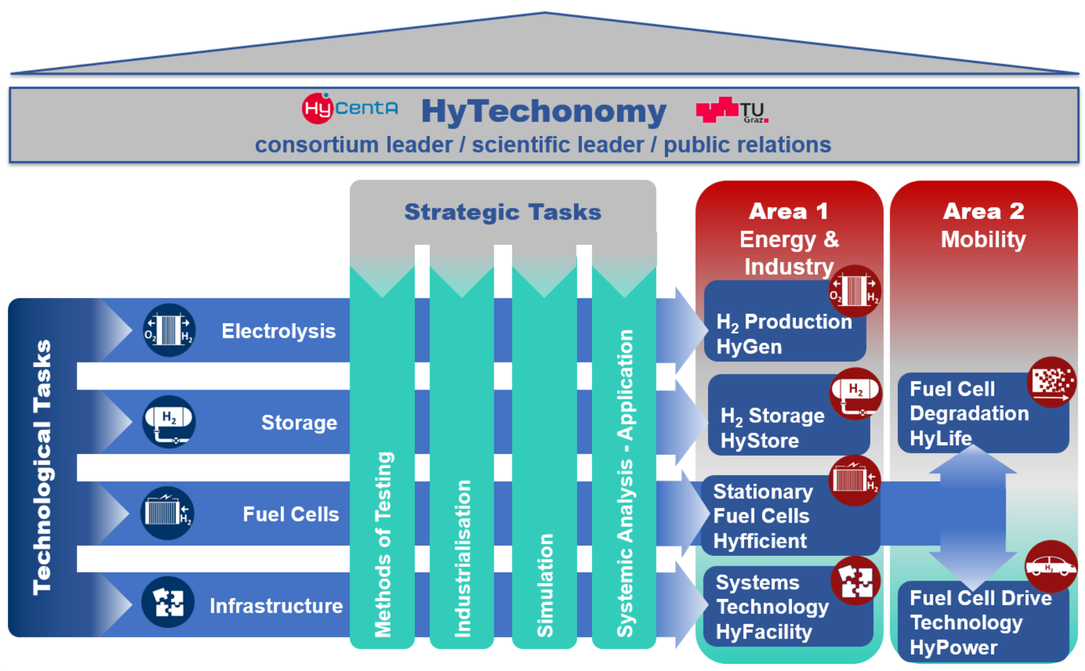
4 years

6 sub-projects

Scientific Partners:
HyCentA, TU Graz: IWT, CEET & IVT; LEC, AIT, Profactor, BEST

Industry Partners:
AVL, Verbund, Fronius, Henn, Postbus





HyLife – Degradation & Testing PEM Fuel Cell

Motivation

Degradation of cells in the fuel cell stack can cause the largest exergy losses in a fuel cell system. During operation, degradation mechanisms cause an increase in exergy losses over time and thus, reduce the lifetime of the system significantly. This makes the degradation and corresponding lifetime the main challenge in fuel cell development at the moment.

The predominant degradation mechanisms are not fully understood yet. Advanced testing methods to investigate degradation as well as diagnostic tools for in-situ use and prediction of lifetime are still on an early research level and not yet commercialized.

Objective

The objective of the HyLife project is to develop advanced Accelerated Stress Test (AST) procedures and to develop a diagnostic tool chain for PEM Fuel Cell degradation on cell, stack and system level to enable high quality products with increased lifetime. Also, the aim is to show the interactions between cell, stack and system level in regards to degradation for the first time.

AST are used to simulate and shorten real-life operating conditions and transfer the knowledge on degradation testing to real life operation. The diagnostic tool chain enables a quick and easy monitoring of the functional state of health of the fuel cell.

HYTECHONOMY
Bundesministerium Digitalisierung und Wirtschaftsstandort
Bundesministerium Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie
FFG Promoting Innovation.
Das Land Steiermark
ober österreich