Hydrogen Europe:
European Hydrogen & Fuel cell Project Database

Project STAGE-SOFC

Innovative SOFC system layout for stationary power and
CHP applications

The aim of the project is to develop a Proof-of-Concept (PoC) prototype of a new SOFC concept with a serial connection of one exothermal CPOx stage with one or a multiple of endothermic steam reforming stages. The system will combine the benefits of the simple and robust CPOx layout with the high efficiencies obtained by the steam reforming process. It requires two reforming stages that are both operated adiabatically so that the system can be kept simple and compact. Furthermore, a staged cathode air supply allows an individual control of stack temperatures and saving of costly heat exchanger area. Based on a successful lab-type proof of feasibility, a PoC system will be developed that achieves an electrical efficiency of at least 45 % and a thermal efficiency of higher than 85 %. The system will be designed for small-scale CHP and off-grid applications in the power range of 5 to 50 kW. It will be operated with natural gas, but also options for operation with biogas and LPG will be investigated. A techno-economical study will validate business cases and derive requirements from the application side that have a large impact into the design of the system. The projects targets at the development of a 5 kWel PoC prototype that will show the feasibility of the staged stack connection within a compact, production optimized, scalable and robust system concept. The prototype will be operated according to the load profiles that are derived from the application. Critical components like adiabatic pre-reformer, power electronics and the design of a compact hotbox are addressed within the project. The Proof-of-Concept prototype should reach a maturity that allows a fast evolution to a field test system. The PoC design is based on a preliminary exploitation plan that takes into account a poten-tial market size and a viable route-to-market. Detailed techno-economic investigations will be performed in order to assess the best business cases for the proposed product.

Project Information

Type of project : Research
Timing : 01/04/2014 > 31/10/2017
Project website: http://www.stage-sofc-project.eu/
Project Budget : 3.970.268 €

Funding

European Union through FCH JU: **Grant agreement 621213** - **CORDIS link**

Project partners

Coordinator :

Teknologian tutkimuskeskus VTT Oy

Partners :

Sunfire

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Sub project(s)

Sub project 1

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Sub project categories

Research

Project Id: 1097

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