

Integrated Biomass – Solid Oxide Fuel Cell Cogeneration (WoodGas-SOFC)**

Scope of project

Biomass conversion, via gasification of solid fuel (wood), typically achieves 25 to 30 % electrical efficiency and 50 % thermal efficiency in engines or turbines. With high temperature fuel cells, capable of direct conversion and of thermal integration of process steps like the gasification, an electrical efficiency of up to 50 % is possible. Part of the remaining heat fraction is available at useful temperature levels for cogeneration applications. It is a particular challenge to achieve this for small scale application (

The strategic goal is to prove the techno-economical feasibility of wood gas as representative case of a (renewable) fuel obtained by gasification fed to a temperature-compatible, emerging Combined Heat and Power (CHP) system like the solid oxide fuel cell (SOFC), and identify optimal scales of such integrated systems. The aim of the project is the development of competence (understanding) and technologies (methods, tools).



Ceramic candle filter for hot ash cleaning of raw woodgas, after 400 h of operation (480 kg wood).

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**) Finished project