

October 2016

Demstack project successful completion

DeMStack was a 3-years FCH-JU project entitled "Understanding the Degradation Mechanisms of a High Temperature PEMFC Stack and Optimization of the Individual Components" with Grant Agreement No 325368 and comprised of 7 partners from Greece (FORTH, Advent, Helbio), Norway (Prototech), Belgium (JRC-IET), Spain (CIDETEC) and Czech Republic (ICTP). The target was the stack optimization and construction based on the high temperature MEA technology of ADVENT S.A. and its testing in combination with a fuel processor with the main goal to be the enhancement the lifetime and reduction the cost of the overall HT PEMFC technology.

The projects outcome are listed below.

- Fuel Cell Stack Power output of 1 kW (small scale-domestic category) operating on reformates with electrical efficiency exceeding 40% and operating temperature 180°C.
- Operation over a wide range of reformates, ($H_2=50-100\%$, $CO = 0-4\%$, $steam = 0-30\%$).
- Overall cost reduction by a factor of 2 resulting by the significant reduction of the MEA's cost due to the lower Pt loading and the cheaper membranes.

Integrated system:

- Power output 0.9 kW with electrical efficiency >38%.
- Operation under steady state and dynamic conditions within a wide range of power output (0.5-0.9kW).

Possible applications of DeMStack technology can be found in Auxiliary power units (3-10kW), CHP units, Battery chargers with LPG (300 W), Power supply in remote/off grid areas (2kW), Regenerative fuel cells for space (3kW satellites) and Stationary back up power systems.



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