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Improved electrolysis for distributed hydrogen production

GA No. 700008

**High Performance PEM Electrolyser for Cost-effective Grid
Balancing Applications**



HPeM2GAS - Deliverable report

**D5.3 Advanced PEM stack integrated into 180 kW
prototype PEM electrolyser system**

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Publishable summary

The next generation water electrolyzers must achieve better dynamic behaviour (rapid start-up, fast response, wider load and temperature ranges) to provide superior grid-balancing services and thus address the steep increase of intermittent renewables interfaced to the grid. The HPEM2GAS project aims to develop a low cost polymer electrolyte membrane (PEM) water electrolyser optimised for grid management through both stack and balance of plant innovations, culminating in a six month field test of an advanced 180 kW (nominal) PEM electrolyser. The electrolyser developed implements an advanced balance of plant and improved stack design and components, which will contribute significantly to reducing the electrolyser CAPEX and OPEX costs.

One of the technical objectives of HPEM2GAS is the designing, developing and building of a compact PEM water electrolyser stack prototype, with 75 cells of industrial applicable dimensions (415 cm² active area), implementing low-cost coated titanium cell components and advanced bipolar plates with a cost-effective, durable, flow-field free design. Previous work looks at achieving these objectives in a lab based environment on short stack modules. This report summarises the build, test and installation of the full 75 cell, 180kW stack into the electrolyser system.