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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

**D5.1 Fact based assessment of a state of the art PEM
Electrolyser**

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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 PEM electrolyser optimised for grid management through both stack and balance of plant innovations, culminating in a six month field test of an advanced 180 (nominal) - 300 kW (transient) PEM electrolyser. The electrolyser developed will implement an advanced balance of plant and improved stack design and components, which will contribute significantly to reducing the electrolyser CAPEX and OPEX costs.

As part of the project, a review of a state of the art PEM water electrolyser manufactured by ITM Power, already deployed in the field has been conducted in order to understand the limitations of the system and in particular its balance of plant (BoP), to provide a benchmark with which to measure BoP innovations within the HPEM2GAS project against. The review covers a number of areas including; load behaviour, performance, efficiencies and manufacturing and maintenance costs.