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Improved electrolysis for distributed hydrogen production

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



HPeM2GAS - Deliverable report

**D4.3 Data-set on stack assembling, testing and validation
under realistic operating conditions**

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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.

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. The operating targets for the prototype stack are an average cell voltage in the range of 1.8 V at a current density of 3 A/cm² under nominal operation and 2.0 V at 4.5 A/cm² under transient operation. This report summaries the development work carried out towards these objectives.