Hydrogen Europe:
European Hydrogen & Fuel cell Project Database

Project IMPALA

IMprove PEMFC with Advanced water management and gas diffusion Layers for Automotive application

The purpose of the IMPALA project is to manufacture improved GDL to increase performance (up to 1 W/cm²) and durability of PEMFC for automotive applications. Two approaches will be followed: i) Homogeneous GDL will be modified to ensure a better water management on anode and on cathode side (formulation of the MPL, wettability, stability of the hydrophobic treatment, hydrophilic layers, and conductive additives). Most of these modifications should be transferable to industry. ii) More innovative non uniform GDL will be manufactured to adjust their local properties to the non uniform local operating conditions of a PEMFC (gradients of porosity and of wettability, patterns of hole). This is a higher risk approach as some modifications could be difficult to transfer to industry but the improvements should be higher and lead to breakthrough GDL. This technological work will be supported by a deep water management analysis combining the most advanced two-phase models (Pore Network Modelling) and the most advanced experimental diagnostics (liquid visualisation by X-Ray, local instrumentation). This will allow having a much better understanding on water management and on the link between main properties of GDL (thickness, pore size and wettability distribution...) and their performance in PEMFC. This will ensure important scientific progress and provide recommendations for design. The project is focused on standard automotive conditions but special attention will be paid to ensure the improvements will be valid for higher operating temperatures and different stack design for back-up applications. The consortium gathers the necessary international complementary leading expertise to reach the project targets: INPT: two-phase modelling, PSI: X-Ray visualisation, JRC: modelling and tests, CEA: performance modelling, tests and modification of GDL, DLR: characterization, SGL: manufacturing performing GDL, and NEDSTACK: stack tests for automotive and back-up application.

Project Information

Type of project : Research
Timing : 01/12/2012 > 30/11/2015
Project website: http://www.impala-project.eu/
Project Budget : 5.081.586 €

Funding

European Union through FCH JU: **Grant agreement 303446 - CORDIS link**

Project partners

Coordinator :

CEA - Commissariat à l'énergie atomique et aux énergies alternatives

Partners :

DLR - German Aerospace Center

PSI - Paul Scherrer Institut

Nedstack fuel cell technology B.V.

JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION

INSTITUT NATIONAL POLYTECHNIQUE DE TOULOUSE

SGL CARBON GMBH

Sub project(s)

Sub project 1

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Sub project categories

Research

Project Id: 1022

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