



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project PUMA MIND

Physical bottom Up Multiscale Modelling for Automotive PEMFC Innovative performance and Durability optimization

Proton Exchange Membrane Fuel Cells (PEMFCs) are complex nonlinear systems. In order to improve their durability, efficiency and to decrease the cost, time of development, design of new diagnostic tools is crucial. Powerful mathematical models of the dynamic behaviour of PEMFCs are necessary for the design and improvement of diagnostic tools. The project PUMA MIND will enhance the understanding of interaction, competitions and synergies among the mechanisms at multiple scales and lead to the development of robust dynamic macroscopic models for control-command purposes with predictive capabilities. The novel mathematical models developed by PUMA MIND will be tested by an experimental work, in order to ensure the applicability on commercial attainable components and catalysts. The most suitable catalysts for the MEA manufacturing technology will be used for these experiments. The implementation of the developed models on the mentioned above catalysts might allow a significant impact, and might also contribute to the most promising solutions based on current EU industrial available components. Operation conditions and control strategies to enhance the durability of automotive PEMFC will be derived on the basis of the multiscale modeling approach proposed by PUMA MIND.

## Project Information

**Type of project :** Research

**Timing :** 17/12/2012 > 16/12/2015

**Project website:** <http://www.pumamind.eu/>

**Project Budget :** 4.092.629 €

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## Funding

European Union through FCH JU: **Grant agreement 303419 - CORDIS link**

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## Project partners

**Coordinator :**

[CEA - Commissariat à l'énergie atomique et aux énergies alternatives](#)

**Partners :**

[DLR - German Aerospace Center](#)

[University of Salerno](#)

[CNRS - Centre National de la Recherche Scientifique](#)

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Simon Fraser University

VODERA LIMITED

IDIADA AUTOMOTIVE TECHNOLOGY SA

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## Sub project(s)

### Sub project 1

**Country:** France

**Address:** RUE LEBLANC 25 75015 PARIS 15

**Sub project categories**

Research

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Project Id: 1071

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