



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project D-CODE

### DC/DC COnverter-based Diagnostics for PEM systems

The D-CODE project aims at developing and implementing on-line electrochemical impedance spectroscopy (EIS) to have direct and meaningful information on the system status. EIS has been proven to be an effective diagnostic tool for laboratory tests. It will be implemented on-board thanks to a new DC/DC converter conceived by the D-CODE's partners. The new hardware will be developed together with dedicated power electronics functions that will enable the measurement of the impedance spectrum. Dedicated on-line diagnosis algorithms will be implemented according to different approaches to effectively monitor faults or degradation mechanisms. Two stationary PEM fuel cell applications will be considered, namely low temperature power backup and high temperature CHP, these two configurations cover all the potential stationary use of PEM fuel cell systems. Extensive testing will be performed to validate the diagnostic strategies and evaluate their effectiveness in improving control actions aimed at optimizing operating conditions and increasing lifetime. The D-CODE diagnostic concept relies on the combination of power electronics hardware and diagnostic algorithms, whose functions can be easily extended to other applications of PEM fuel cell systems and, in perspective, to all FC technologies as well. The D-CODE project's outcomes are expected to improve management and operational capabilities of both low and high temperature PEM fuel cells, to enhance monitoring capabilities, increase maintenance time with higher MTBF and reduce degradation rate. These achievements are crucial and will foster the deployment of PEM fuel cells for on field use. The D-CODE project gathers together a group of research institutions and industries whose skills guarantee the required knowledge to convey the project from the EIS concept to its on-field implementation.

### Project Information

**Type of project :** Research

**Timing :** 01/03/2011 > 31/05/2014

**Project website:** <http://www.d-code.unisa.it/>

**Project Budget :** 2.215.767 €

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### Funding

European Union through FCH JU: [Grant agreement 256673 - CORDIS link](#)

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### Project partners

**Coordinator :**

[University of Salerno](#)

**Partners :**

[EIFER - Europäisches Institut für Energieforschung](#)

[Ballard Power System Europe A/S \(Previously Dantherm\)](#)

UNIVERSITE DE FRANCHE-COMTE

CIRTEM

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INNO TSD

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[Sub project\(s\)](#)

**Sub project 1**

**Country:** Italy

**Address:** VIA GIOVANNI PAOLO II 132 84084 FISCIANO SA

**Sub project categories**

Research

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Project Id: 939

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