

**IEEE VPPC 2010**

Vehicle Power and Propulsion Conference  
September 1-3, 2010 – Lille, France

**Clean Tech for Transportation**

<http://www.vppc2010.org/>



## Tutorial on

### FUEL CELL SYSTEMS FOR TRANSPORTATION APPLICATIONS

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### Abstract

Continuous depletion of crude oil supply and the gradual increase in oil prices have emphasized the need for a suitable alternative to our century-old oil-based economy. A clean and efficient power-supply device based on a renewable energy source is needed to address this issue. Among the different technological alternatives, fuel cell (FC) power generation becomes a more and more interesting and promising solution for both automotive industry and stationary power plants. However, many technological hurdles have still to be overcome prior to the development of industrial and competitive products in these fields.

The aim of this tutorial is to give an overview about the actual state-of-art on this topic, especially focusing on the automotive market. Topics that will be presented: historical background, FC technologies, FC systems and their requirements for the automotive market, lighthouse projects, difficulties for a mass market.

### Biographies of the Speakers



**Daniel HISSEL** is currently a Full Professor at the *University of Franche-Comté* and Head of the “Energy systems modelling” research team at the FEMTO-ST (CNRS) Institute. His main research activities are concerning fuel cell systems dedicated to automotive and stationary applications, modelling, non linear control and energy optimization of these systems and fuel cell system diagnosis. He is Associate Editor of *IEEE Transactions on Industrial Electronics* and Associate Editor of *ASME Fuel Cell Science and Technology*. He is also the President of the *IEEE VTS French Chapter* and member of the advisory board of the *MEGEVH network*, the French national network on EV and HEV. He is a member of the FCLAB Institute (dedicated to fuel cell research) and has published more than 150 scientific papers in peer-reviewed international journal and/or international conferences.



**Marie-Cécile PERA** is a Full Professor at the *University of Franche-Comté* and deputy director of the Energy Department of FEMTO-ST (CNRS) Institute. Her main interests are modelling of polymer electrolyte fuel cell (PEFC) and solid oxide fuel cell (SOFC). She also studies system architecture for energy optimization and control of hybridized system (batteries, supercapacities and fuel cell). She has contributed to more than 150 publications in international scientific journals and international conferences. She gives courses in electrical engineering at the Institut Universitaire de Technologie (IUT) de Belfort-Montbéliard for Bachelor Degree and at the University of Franche-Comte for Master Degree.

### References

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