

# Fuel Cell & Hydrogen 2013

## From Materials Research to Ramping up Production



# Book of Abstracts

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## Parallel Session: Stationary Fuel Cells

### **Biomass Fuels in SOFC**

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Resulting from growing concerns on climate change and resources depletion, biomass has gained increased importance. Security of supply, better environment and economic development, as worldwide goals, are usually drivers for economic growth. Technology developments have adequately not responded to challenges to diversify resources to substitute carbon-intensive fossil fuels at competitive prices. State-of-the-art energy technologies, although advanced, are facing constraints, justifying increasing efforts in demonstrating efficient and more environmentally friendly technologies.<sup>[1]</sup> Bioenergy is emerging as a credible possibility in providing energy. Technology advances are significant both for hydrogen production and fuel cells. IEA identified hydrogen and fuel cell technologies promising, however, needing further R&D for breakthroughs with reduced costs to enable a better market penetration.<sup>[2]</sup>

Fuel cells are known for their low environmental impact and potential high electrical efficiency, compared to conventional power systems. SOFC technology offers modular solutions for renewable power generation and it can operate at high temperatures with low stringent requirements for fuel gas quality. This broadens the range of gas quality and of biomass conversion processes to be used. Extensive R&D work has been carried out on hydrogen and other combustible gases from biomass at LNEG.<sup>[3-5]</sup> The studies performed have focused on both conversion platforms: biological and thermochemical. In the case of biological processes, further research is needed towards commercialization for processes under development to improve H<sub>2</sub> production yields. In the case of thermochemical conversion, fluidised bed technology has been developed for biomass gasification and co-gasification. Recent studies have been focused on the hot gas cleaning process with success. Results showed a composition for the gas with low particles and tar contents. Different types of biomass matter, including wastes of different origin and microalgae matter are currently being studied. The objective is to ensure sustainability for the process, yielding a continuous gas stream feeding a SOFC.

#### **References**

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