

## Project Information

**Subject:** **Midi Buses with Fuel Cell Hybrid Drive  
at the Messe Düsseldorf**



**Applicant:** Rheinbahn AG  
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Miet- und Sonderfahrdienste Ohlmann  
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**Project Schedule:** 01/2007 – 12/2011

**Project Partners:** Messe Düsseldorf GmbH  
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### Project Description:

Two midi buses with fuel cell hybrid propulsion will be applied at the Messe (Fair) Düsseldorf for the next 5 years. The buses will be operated by the public transportation service Rheinbahn and the private bus company Ohlmann in regular line operations. The buses are based upon a conventional electric powered bus that has been equipped with the hybrid propulsion system by the Hydrogenics GmbH (located in the city of Gladbeck). This hybrid drive train consists of the primary fuel cell combined with an additional new battery system. Under normal conditions the fuel cell provides the power for the electric engine, whereas peak power is delivered by the battery (nickel-cadmium). The integrated energy management system controls the choice of the respective supply source - unnoticed by the driver and the passengers. Regenerative braking recharges the battery in an environmentally sound way. The development of the midi bus prototype was funded by the Federal State Nordrhein-Westfalen as well.

The Air Liquide Deutschland GmbH is a specialist for technical and medical gases and provides the hydrogen fuelling station as well as the hydrogen for the refuelling of the buses. The filling of the buses is currently realised through the pressure difference between the filling station storage packs (200 bar) and the bus tank. The range of the buses with a tank content of 6 kg hydrogen amounts to about 200 kilometres. The bus offers space for 22 passengers (length: 5.3 m, width: 2.1 m) and achieves a maximum speed of 33 km/h. Therewith it is optimally suited for the transportation needs of the fair. The vital advantage of the midi bus is that the rather small fuel cell is cost effective but provides the same practical experiences as the larger and more costly fuel cell.

The long-time operation at the fair takes place under real life conditions and is supposed to deliver crucial findings on the technique, utilisability and reliability of the bus, especially of the hybrid propulsion with the fuel cell. The experiences will be incorporated in the further development of the technology and will contribute to take the fuel cell into the market.



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