

Zero Regio: Recent Experience with Hydrogen Vehicles and Refueling Infrastructure

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This document appeared in

Detlef Stolten, Thomas Grube (Eds.):

18th World Hydrogen Energy Conference 2010 - WHEC 2010

Parallel Sessions Book 5: Strategic Analyses / Safety Issues / Existing and Emerging Markets

Proceedings of the WHEC, May 16.-21. 2010, Essen

Schriften des Forschungszentrums Jülich / Energy & Environment, Vol. 78-5

Institute of Energy Research - Fuel Cells (IEF-3)

Forschungszentrum Jülich GmbH, Zentralbibliothek, Verlag, 2010

ISBN: 978-3-89336-655-2

Zero Regio: Recent Experience with Hydrogen Vehicles and Refueling Infrastructure

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Abstract

The project Zero Regio, co-financed by the European Commission within the 6th Framework Program, aims at demonstrating hydrogen infrastructure and fuel cell passenger vehicles in European cities. Demonstration activities have taken place in Germany and Italy. Hydrogen from two different sources – chemical by-product in Germany and natural gas reforming in Italy – was employed in fleet demonstration. Five Mercedes-Benz A-Class F-CELL vehicles, including one vehicle with 700 bar storage, have been tested in Frankfurt and three fuel cell vehicles (Panda) from Fiat have been demonstrated in Italy. Both fleets have gone through real-life driving cycles over a long period (3 years ending in November 2009). Experience with this demonstration is presented. Evaluation of data collected and analyzed during the demonstration is presented, providing important information on the performance, availability, maintenance requirements, and consumption of the FCVs tested in comparison with conventional vehicles. Some socioeconomic aspects of the fleet demonstration and the dissemination activities are also presented. Experience with refueling the FCVs is presented. At both sites, Frankfurt in Germany and Mantova in Italy, public multi-energy service stations have been built within the project. Significant characteristics of hydrogen infrastructure at these stations, such as high-pressure pipeline transport, on site production, compression schemes, precooling of hydrogen, dispenser designs, and communication between vehicle and dispenser, with regard to refueling of compressed hydrogen (at 350 and 700 bar) is briefly described. Based on the demonstration experience, areas in both fuel cell vehicles and hydrogen infrastructure where further development is necessary are highlighted. Future developments regarding the filling station and the growing demand for hydrogen and filling stations are also discussed.

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