Hycity: Hamburg runs on hydrogen

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The German city of Hamburg has bundled its locally available competence to become 'hycity' or, as the city likes to call it, 'the gateway to tomorrow's energy world'.

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The Energy Department of Hamburg's Ministry for Urban Development and the Environment (BSU) coordinates the project and is responsible for communication. There are various working groups to initiate projects within the hycity project, revolving around research and education, industry support or the implementation of so-called 'lighthouse projects'.

An impressive list of partners is the result of Hamburg's bundling force. Many of the initiatives revolve around sustainable mobility.

Buses

Railway and bus operator HOCHBAHN runs Germany's second largest public transport system, the Hamburg Hochbahn. As part of the European HyFLEET:CUTE programme – the extension of the successful Clean Urban Transport for Europe (CUTE) project – the company tested hydrogen powered buses in regular services. HOCHBAHN prolonged the testing after the European project ended and currently has nine hydrogen buses on the road.

Hydrogen on water

A lot of boating seems to be going on in Hamburg, whether in the form of the lighthouse project ZEMship (see highlight below); the H2yacht, which makes silent boating possible areas where noisy combustion engines are unwanted; the PURShip HADAG ferry, running on hydrogen produced by the Hamburg Water Group (a.o. Hamburger Water Works and Hamburg Public Sewage Company) from sewage sludge; or the fuel cell certification by Hamburg-based company Germanischer Lloyd.

This company has been involved in interesting projects for years, such as the commercial fuel cell driven passenger vessel Hydra, the first of its kind to be German government-approved, and the fuel cell system of the 15 kW propulsion system of sailing yacht No.1. Germanischer Lloyd has recently been testing the first ZEMship.

Flying fuel cells

The city’s airport is very active in the field of sustainable mobility as well. Not only does it use green vehicles on the ground, for which the airport has installed its own hydrogen filling station, it also cooperates with Airbus.

This aircraft manufacturer has embraced fuel cell systems for economical and ecological reasons. In a long term research project, Airbus, together with research institutes and universities, is investigating the possibilities for a fuel cell driven on-board emergency power supply. The next step will be to investigate substitution of the entire on-board energy generation.

Seen before

Where have we seen a project like this before? In Toronto, Canada, public-private partnership Hydrogen Village has more or less the same objectives. The Canadians want to keep all options open by stressing that hydrogen and fuel cell knowledge and capacity bundling is just the beginning. But the name gives them away.

Related article: Canadian Hydrogen Village aims at early adopters

Highlight: ZEMship

The development of a totally fuel cell powered vessel to accomodate a hundred passengers has been an impressive project. Ten partners, lead by Hamburg, joined forces in this European Union funded, 5,2 million Euro project. The result: a 25 metre long zero-emission ship, or ‘ZEMship’.

Late 2006 the first vessel was ready to be tested by Germanischer Lloyd. If all goes according to plan, it will start operating this summer on Hamburg’s Alster lake and in the historic warehouse district of Speicherstadt. At the recent Hydrogen + Fuel

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cell Group Exhibit at the Hannover Messe, BSU’s Anke Stopler and Carola Thimm of hySOLUTIONS proudly presented the ship.

Fuel

The ZEMships are propelled by electrical energy coming from two fifty kW PEM fuel cells in which hydrogen is converted. Linde Gas supplies the hydrogen. Part of the project is a hydrogen refuelling station to be used by the vessels every two to three days.

Efficient and clean

The benefits of the ZEMship? It is designed to be nearly twice as efficient as conventional diesel powered ferries and it is much less polluting than Alster lake’s original coal-fired steamer ferry. It produces very little noise, vibrations or water pollution, and zero emissions. Last but not least, the project creates jobs as well.