Press release

The Future of Transportation is Clean

Europe's biggest fuel cell bus project – CUTE – has been completed. The results are being summarized at a two-day congress in Hamburg. Today manufacturers, public transport entities, energy suppliers and scientists praised the high availability levels of the new buses and the reliability of the infrastructure and technology. But all those involved still see a need for further action: "The road from prototype to market launch still lies ahead of us."

Hamburg (eos) – A joint vision, ground-breaking technology and a commitment to cross-border cooperation between companies and countries: these are the factors that helped to make CUTE (short for: Clean Urban Transport in Europe) a success. With financial assistance from the EU, the two-year practical test with a total of 27 fuel cell units (Mercedes-Benz Citaro buses) took in nine major European cities in seven countries, their public transport entities, eight industrial partners and eight research and consulting companies. Following its successful completion, the project partners presented their results at the international CUTE congress in Hamburg on 10 and 11 May. "The Future of Transportation is Clean," was its motto. "In all respects this large-scale practical test confirmed that fuel cell power is one of the most important options for the future of transport," say the organizers.

Nine cities create hydrogen infrastructure

The cities of Amsterdam, Barcelona, Hamburg, London, Luxembourg, Madrid, Porto, Stockholm and Stuttgart each report on their experience with three fuel cell buses which they integrated into their local passenger transport fleet for a test period of two years.
To be able to refuel the buses with compressed hydrogen gas, the cities established their own supply infrastructure. Various methods of producing and storing the hydrogen were tested: from on-site production by means of electrolysis or steam reforming, to supplies of liquid hydrogen from a central production location. All these methods still have their

advantages and disadvantages. Electrolysis permits the best use of energy generated from renewable sources. But it is currently too expensive. Natural gas from which hydrogen is obtained during the reforming process is widely available at reasonable prices, but CO_2 is emitted during production. And although centralized production allows hydrogen to be produced in large quantities, energy is lost through liquefying it for transport.

The transport companies' experience

In this practical test, the focus was on the reliability and maintenance requirements of the systems. Those who used electrolysis of water reported favourably on their on-site systems. Methane steam reforming caused some problems: Although large-scale production of hydrogen from natural gas has been common practice for years, the users of the new local systems reported difficulties – for example when utilization was high.
On average, the availability of the refuelling facilities was in excess of 80 percent. For most of the filling stations, availability actually topped 90 percent, a result that many operators found satisfactory. What they praised in particular, however, was the great reliability of the fuel cell buses. Even the vehicle manufacturers could not have foreseen that the life of "fuel cell stacks" would reach levels in excess of 3,000 operating hours.
In view of this experience, Hamburg has already enlarged its fleet of environmentally friendly buses, and London and Amsterdam have announced their intention to do the same.

But it was not only the technology that proved convincing: "We also achieved our quality and safety targets," said the satisfied CUTE partners. However, there is still room for improvement. Even during the project, the companies responsible made modifications to the refuelling system, for example by altering the tank filler nozzles. There is also potential for improvement when it comes to ease of handling and the time involved in the refuelling process.

Future benefits for the environment

Hydrogen-powered fuel cell buses have zero emissions: all they output is water vapour, and they run almost noiselessly – a great advantage over conventional buses, which pollute cities with carbon dioxide, soot and noise, and use up fossil fuels while doing so. But any serious assessment of environmental impact has to include the entire product life cycle in its approach. Environmental burdens arise during the production, storage and distribution of the hydrogen needed to run the fuel cell buses, and in the manufacture of the vehicles themselves. For this reason the project partners want to make increased use of renewable energy sources for the production of H_2 in the future and also reduce the amount of energy that goes into making the buses: "In this way we will substantially improve the overall energy balance of the fuel cell buses. The results of the present life cycle analysis are providing us with important data for this purpose. This will enable us to measure our progress."

Tasks for the future

Further challenges have to be overcome before the fuel cell buses are ready for the market: at present the technology is still too expensive for series production. But if the fuel cell experts achieve their declared objective and succeed in doubling the life and efficiency of their fuel cells while at the same time reducing prices considerably, the situation could change in the foreseeable future. Other factors that will determine the point at which alternative drive systems become competitive are oil price trends, emission legislation and the establishment of a hydrogen supply infrastructure.

Moreover, it is important to ensure that politicians at all levels and the general public are better informed about the complex technology and its potential. "Broad trust and support for technology are essential prerequisites for our success," emphasize the congress organizers.

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Relevant pictorial material is soon available from: www.cute-hamburg.de

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