

## Fuel cell buses on Route RV1

Route RV1 between Covent Garden and Tower Gateway has been chosen as the second route on which to trial the fuel cell buses. As conventional Citaro buses already operate on this route it will help in comparing the performance between fuel cell and diesel vehicles. Buses began running on RV1 in September 2004 and will remain on this route until the end of the trial in December 2005.

The fuel cell buses first went into service in January 2004 on route 25, with two buses in operation each day. The buses ran in addition to the normal service, as London Buses needed to assess how reliable they would be. The buses have however proved so reliable that when they were switched to RV1 all three buses were put into service and ran as part of the normal timetable.

The operating and environmental data gathered by London Buses will play a major part in helping the project partners understand how fuel cell technology actually performs in daily service and what improvements can be made for the next generation of fuel cell vehicles. The results so far have been very promising and show that hydrogen fuel cell vehicles could prove to be a realistic alternative to diesel in the future.

**Like most of the London bus fleet, fuel cell buses provide full low-floor access.**

## Partners in progress

**London Buses** is part of Transport for London, and is responsible for achieving environmental targets and standards for the whole of London's bus fleet, as required by the Mayor's Air Quality Strategy.

**First** operates around one sixth of the London bus network. Their experience, support and expertise in transit management is crucial in ensuring the trial is conducted and assessed to rigorous standards.

**BP** is providing the hydrogen-refuelling facilities for the fuel cell buses. BP is an infrastructure partner in five of the nine CUTE (Clean Urban Transport for Europe) cities and is demonstrating a range of different hydrogen technologies in each location. **BOC** is supplying the hydrogen technology to BP in London.

**Energy Saving Trust** is supporting the project through a grant from its New Vehicle Technology Fund programme (supported by the Department for Transport).

**Daimler Chrysler** has developed and manufactured the buses and will provide technical support during the trial.

The **European Union** has co-financed the trial, with the support of the European Commission Directorate-General for Energy and Transport.

 75% recycled, 25% sustainable source

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London Buses

# Hydrogen. A fresh route to cleaner air



Energy  
Saving  
Trust



**First**  
transforming travel

Department for  
**Transport**



DAIMLERCHRYSLER

MAYOR  
OF LONDON

Transport for London



## London leading the way

London is taking part in a pioneering project to reduce air pollution and noise by testing the first generation of zero emission fuel cell buses. This important initiative is a key part of the Mayor's Transport and Air Quality Strategies, which are designed to help give Londoners a cleaner and healthier future. Not only is the fuel cell bus trial a significant step towards achieving that goal, it also demonstrates that London is leading the way in alternative forms of public transport.

## Energy efficient

Nine cities in Europe are taking part in the fuel cell bus trial, making it the largest project of its type anywhere in the world. The reason it's so important is because local air pollution, greenhouse gas emissions and inner-city noise levels are major causes for concern.

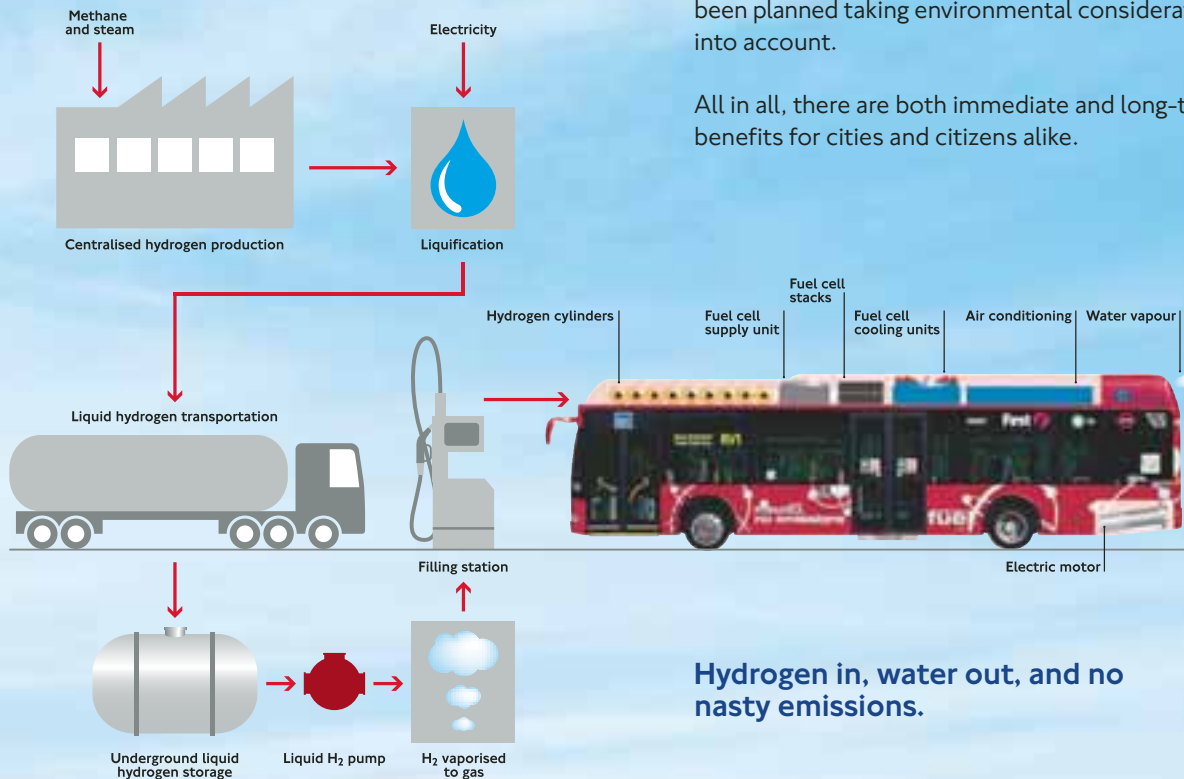
The project brings together over 40 organisations including the bus manufacturer, operating companies, hydrogen suppliers, fuelling and storage facilities, and universities. It is part of the ongoing development of clean urban transport systems which combine energy efficiency with cost-effectiveness.

The fuel cell buses will be subjected to rigorous environmental, technical and economic analysis, which will then be compared to conventional bus transportation. By the end of the trial London will have made a major contribution to a much-needed initiative, the results of which are eagerly awaited by transport authorities and governments across the globe.

The new Mercedes Citaro buses, which have been built by Daimler Chrysler especially for this trial, use the latest fuel cell and hydrogen technology.

## How do fuel cell buses work?

Very simply, a fuel cell is like a battery. As hydrogen gas flows into the fuel cell, the hydrogen combines with oxygen and is converted into water, in the process producing electricity. The only emission from the fuel cell bus is water, which forms a vapour cloud as it leaves the exhaust and enters the atmosphere.



Hydrogen can be made from a number of different sources including natural gas and the splitting of water into hydrogen and oxygen (electrolysis). The hydrogen is then liquefied by cooling it down to a very low temperature.

The liquid hydrogen is delivered to the fuelling site where it is dispensed as a gas into pressurised cylinders. These are the cylinders you can see on top of the bus, along with the fuel cell system, coolers and other components.

Just as importantly, the infrastructure and support systems needed to conduct the trial – such as the hydrogen refuelling station – have also been planned taking environmental considerations into account.

All in all, there are both immediate and long-term benefits for cities and citizens alike.

**Hydrogen in, water out, and no nasty emissions.**