

# Britain's first dual fuel bus will cut emissions by half

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A consortium brought together by low carbon experts at the University of East Anglia (UEA) is today launching the first bus in the UK to run on clean, biomethane gas.

The innovative dual-fuel diesel-biomethane powered [bus](#) will reduce pollutant emissions and [greenhouse gas](#) emissions by around a half. It is hoped the technology will be rolled out to bus fleets across the country and further afield.

The bus will make its first public showing at LCV 2009, the UK's

leading exhibition of low carbon vehicle technology. The event takes place at the Millbrook Proving Ground in Bedfordshire on September 9 and 10.

The event has been organised by Cenex (Centre of Excellence for low carbon and fuel cell technologies) and is expected to attract around 2000 specialists in low carbon technologies from around the world.

The consortium behind the new bus is led by UEA's Low Carbon Innovation Centre (LCIC) and includes leading independent bus operator Anglian Bus, bus manufacturer Optare plc, and engine conversion specialists Hardstaff Group of Nottingham.

The dual-fuel vehicle is a standard Optare Solo single-deck diesel midibus from the Anglian Bus fleet. Originally powered entirely by diesel, the Mercedes-Benz engine has been adapted to run for 60-80 per cent of the time on clean, low-carbon biomethane.

Biomethane is chemically identical to the methane in [natural gas](#) but it is made by bacterial action on biowastes. Biomethane is extracted from landfill sites or from biogas produced in purpose-built anaerobic digestion facilities.

Project leader Dr Bruce Tofield, of UEA's Low Carbon Innovation Centre, said: "Dual-fuel use is a very attractive option. The vehicle can still run on diesel, providing flexibility, but most of the time is running on biomethane gas which is a much cleaner and less polluting fuel.

"In particular, the cost of conversion of a diesel bus to dual-fuel use is a small fraction of the cost of a new natural gas bus. Conversion to dual-fuel use is potentially a viable option for most if not all diesel buses in the UK and, indeed, across Europe and more widely."

Funding for the project came partly from an EU-sponsored Civitas programme in which UEA and Anglian Bus were partners with Norwich, Norfolk County Council and cities across Europe. The Civitas Initiative exists to promote cleaner and better transport in Europe's cities.

LCIC scientists have been monitoring air pollution in Norwich since 2005 as part of the Civitas programme. In Norwich, as in many UK cities, emissions from buses are of particular concern. They noticed how the buses in Malmo in Sweden, a partner city in the Civitas programme, were powered by clean natural gas (methane), resulting in significantly lower levels of harmful emissions. Of special interest was the fact that Malmo was beginning to use biomethane rather than natural gas to reduce greenhouse gas emissions as well as pollutant emissions.

"This conversion shows just how important EU projects can be in helping us learn from what cities elsewhere have done," said Dr Tofield. "Now we are going one step further and showing how existing bus fleets can be economically converted to low-carbon, low-emissions running. The potential for reducing traffic pollution and greenhouse gas emissions from buses and other fleet vehicles in cities in Britain, Europe, and across the world is very exciting."

Benefits of using biomethane as a fuel include:

- A reduction in particulate and NO<sub>x</sub> emissions levels of around half compared with diesel leading to cleaner air in towns and cities.
- Reduced operating costs on a cost per mile basis
- A reduction in greenhouse gas emissions of around half as a result of using methane from landfill sites, food and agricultural

waste.

Replacing an entire bus fleet with new vehicles is extremely expensive but the LCIC staff realised that a lower-cost solution was already at hand in the UK. Nottinghamshire engineering company Hardstaff Group are world leaders in the provision of natural gas refuelling stations and in the conversion of large vehicles to dual-fuel diesel-gas use. Hardstaff's own fleet of heavy goods vehicles, converted to dual-fuel use, have now successfully covered in excess of 40 million kilometres and now run on biomethane.

Working with local bus company Anglian Bus, the LCIC organised for one of Anglian's Optare Solo buses to be converted to dual-fuel use. The fuel tanks have been installed at Optare's Leeds plant and the engine conversion undertaken at Hardstaff's Nottinghamshire headquarters. In addition, Hardstaff is supplying a gas refuelling station to Anglian Bus and will keep it supplied with biomethane.

David Pursey, chairman of Anglian Bus, said: "Anglian has always tried to be a leader in environmental matters and worked with UEA to demonstrate the benefits of biodiesel in the Civitas programme. We are really pleased to have the first gas-powered dual-fuel bus in the UK in our fleet and look forward to working with our partners to demonstrate the benefits of dual-fuel operation on biomethane."

Trevor Fletcher, managing director of Hardstaff Group, said: "Hardstaff Group's dual-fuel trucks have covered nearly 40 million kilometres and we are really pleased to be working with UEA's Low Carbon Innovation Centre, with Anglian Bus and with Optare to demonstrate our technology on buses for the first time."

Jim Sumner, CEO of Optare, said: "Improving the environmental performance and fuel efficiency of our products is central to our

development strategy as shown by the recent announcement of the Optare Eco Drive programme. We see gas-power, and biomethane in particular, as an important and viable option for buses in UK cities and elsewhere around the world. We have pioneered zero emissions buses with our Solo EV electric model. Now we are able to give operators another choice by offering the first dual-fuel conversion in the country."

Source: University of East Anglia

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