

alternative fuels

We've looked carefully and with an open mind at all the available alternatives to diesel-powered vehicles. *The Route to Cleaner Buses* was recently published by a government-funded organisation which aims to reduce the impact of road transport.¹ This analyses the current range of alternative fuels available, the advantages and disadvantages of operating such vehicles and the range of funding mechanisms available for these. It is essentially a document which assesses long-term strategies, and it states that "before large scale market uptake becomes likely, the cost of alternative fuel powered bus operation needs to be comparable with diesel". There are many ways in which this can be achieved, including a reordering of the taxation regime, but the funding to finance a large-scale conversion away from diesel is simply not available. There are funds for demonstration and research projects, but that is all. Caution is also required when embracing certain types of new alternative fuels: in some cases these would actually increase NOx.

The Oxford Bus Company (OBC) and other bus companies within The Go-Ahead Group have done a great deal of research into the practicalities of using alternative motive power for full-size buses, and we have conducted trials with both gas and electric-propelled vehicles. These experiments have demonstrated that, in the case of electric buses, the vehicles were neither sufficiently reliable nor robust for intensive urban operation.

Gas buses proved much less reliable than diesel alternatives, and brought their own emissions characteristics: for example, CO₂ emissions were higher than an equivalent diesel bus and there are now concerns about the safety of gas buses following a fire at a Dutch installation.

Current experiments are centred on hydrogen fuel cells and on hybrid vehicles. Taking these in turn, the hydrogen fuel trials are being carried out in London, financed by Transport for London (TfL). The buses used in the trial cost £800k each, compared to the cost of our similar Mercedes Citaro single deck diesel buses which cost £140k. The manufacturer states that they would not expect the buses to be capable of operating a full day in service. Hydrogen fuel is beneficial in that the exhaust is water vapour but there are some concerns about the environmental costs of producing the gas in the first place, as well as concerns surrounding the volatility of the fuel.

Hybrid vehicles are theoretically low carbon in that they use a smaller diesel engine running at a constant speed and therefore more efficiently and they benefit from regenerative braking in which the motor functions as a generator and returns power to the battery. A sister company within the Go-Ahead Group will be running twelve of these in London, again funded by TfL due to the prohibitively high capital costs.

There are other experiments being carried out on running diesel buses on potentially cleaner fuels. An extended trial is being carried out with bioblend diesel, involving approximately 120 vehicles for six months. This fuel is a blend of 95% conventional diesel with 5% bio-fuel, processed from oilseed rape. This fuel meets normal international standards and can be used without modification to or adverse consequences for existing vehicles. In theory, this is a lower carbon fuel in that growing the oilseed rape results in carbon dioxide absorption, although some studies suggest that the environmental impacts that would be caused if huge areas of land had to be turned over to the growing of the oilseed rape outweigh the benefits of reduced carbon emissions. In any event, the use of bio-diesel has only a marginal effect in reducing emissions of NOx.

UITP, an international trade body for the public transport industries concluded in 2004 that "diesel oil-based fuels are likely to remain the most widely used fuel for heavy vehicles for at least twenty years".

¹ TransportEnergy, London (2003)