Diesel

Despite electric and diesel-electric hybrid powertrains grabbing many of the headlines, alternative fuels and multi-fuel engines remain powerful options for transport fleets for the foreseeable future, discovers Steve Banner

Bus fleets looking for environmentally-friendly power sources are revisiting compressed natural gas (CNG) as an alternative to hybrid technology, according to MAN. Last year, the company debuted a 272bhp, 1,050 Nm CNG-fuelled EcoCity 42-seater single-decker, which has since entered trials with operators, most notably Reading Transport, where it has been given a pretty clean bill of health.

While the newcomer – which is powered by a E2876 LUH 04 EEV (enhanced environmentally friendly vehicle) engine, with a three-way catalytic converter, matched to a ZF automatic gearbox, with integrated retarder – is £55,000 more expensive than an equivalent single-decker diesel, MAN contends that operators will get this premium back in as little as three years, simply because CNG is 30% cheaper than diesel. What's more, EcoCity can run on climate-neutral biomethane – landfill gas – and meets the imminent Euro 6 exhaust emission limits with ease, MAN states.

No fewer than 34 EcoCities are already scheduled to go into service, initially with two fleets – Arriva and Anglian – under support from the government's Green Bus Fund. That funding should see payback times for the vehicles reduced even further. However, the fact remains that the vast bulk of the 439 low-carbon buses being backed by the fund are hybrids, not gas buses.

Reading Transport ran its EcoCity for five weeks, reports chief executive James Freeman. "It was absolutely faultless and passenger reaction was pretty positive," he says. "The smoothness of the CNG engine was well received... The gas bus went out every morning and we didn't see it until it returned 12 hours later – that's exactly how it should be. MAN seems to have cracked it with MAN EcoCity," he adds.

LNG is being advocated by Volvo Trucks as an alternative to CNG

And he continues: "Emissions are very low indeed and that's in tune with the philosophy of our local authority owners Reading Borough Council. We are due to replace our single-deck fleet in 2013 and the MAN EcoCity proposition appears to be perfectly feasible." Freeman also says his organisation has tried everything – from ethanol to LPG, electric-hybrid, even cooking oil. "The difference with MAN EcoCity is that gas bus technology has come of age. It's a proven power system."

However, the need for separate facilities to refuel CNG vehicles is a drawback, he observes. Hybrids can be refuelled from an ordinary diesel pump and

Reading now has 31 ADL diesel-electric buses in service. Moreover, Freeman worries that roof-mounted fuel tanks, typically fitted to CNG buses, are not ideal. He also wonders about residual value. The same question might be asked of hybrids, but the numbers now going into service will make them much less of a rarity in the second-hand market, he believes, and therefore more interesting to used bus buyers.

That said, Arriva's and Anglian's willingness to put CNG buses into service shows that operators are prepared to commit. Van and truck operators are also switching to gas, too, with biomethane making much of the running. Coca-Cola Enterprises (CCE) has been involved in a year-long trial, comparing the cost of operating a biomethane-

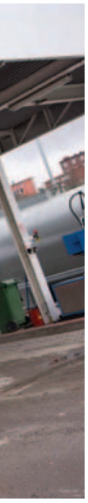
departure?

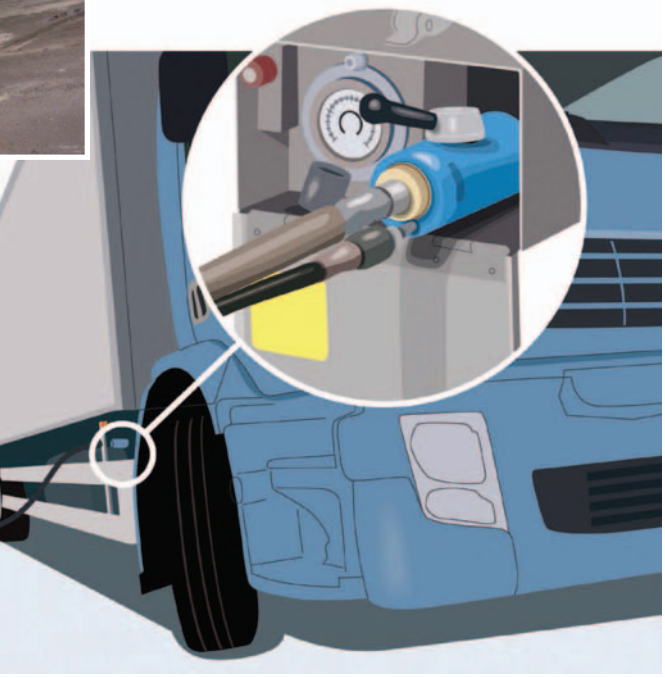
powered Iveco Stralis 26-tonner, and its emissions, with that of a comparable diesel Stralis.

Cenex recently announced the results of the trial – which put the gas Stralis well ahead. Its fuel costs were 12.8% lower than the standard diesel version and its wheel-to-well greenhouse gas emissions were a hefty 50.3% down.

What's more, that reduction was achieved using a temporary refuelling station. Cenex suggests that a more efficient permanent station should bring about a 60.7% emissions saving. The gas Stralis turned out to be as reliable as its diesel counterpart, and now CCE is acquiring 14 gas-fuelled Stralis trucks and a gas station, which opens at the company's Enfield depot this June.

And with the government having recently set up a £9.5m programme to support operators wishing





to run low-carbon trucks, gas burners could well see more interest. They may be fine for vehicles on local delivery work, but one drawback of CNG and biomethane, according to Volvo, is that the tanks are too heavy and bulky for long-distance haulage. Its response is to promote liquefied natural gas (LNG), which, because of its greater energy density, uses much smaller tanks. While LNG, like CNG, remains a fossil fuel, when liquid biogas becomes more widely available, the carbon footprints of trucks using it could shrink by up to 70%.

Certainly, Volvo advocates setting up a network of so-called 'blue corridors' around Europe, with strategically sited LNG filling stations to make the fuel more widely available. The approach is finding favour with the European Commission, which is now setting up a £6.7m trial – although the fact that anybody filling a tank with LNG will be dealing with a fuel at -160°C means new safety procedures and equipment will be required.

Considering all options

The foregoing are by no means the only liquid or gaseous alternative fuels for operators to consider. For example, last year saw Scania receive an order for 158 buses, from public transport company Keolis Sverige in Sweden, capable of running on either ethanol or rapeseed methyl ester. When compared with diesel, the former cuts CO_2 by 70%, according to Scania, the latter by 64%.

But, in considering all the options, DAF's advice is not to forget the virtues of diesel. DAF's UK marketing director Tony Pain reminds operators that: it offers an impressive level of energy density; it is readily available; refuelling with it is comparatively swift and hazard-free; and the tanks are easier to package on a truck chassis than some of those required by alternative fuels.

He concedes that it is a fossil fuel, but counters that the arrival of biodiesel from renewable sources means its make-up is already changing. "What we may see in future is trucks running on diesel that is one-third fossil, one-third bio and one-third synthetic – a fuel that would be good news so far as energy security is concerned," states Pain.

Incidentally, Optare chief operating officer Glenn Saint argues that it is more efficient to use gas to fuel power stations, which are around 60% efficient, than CV engines, which are closer to 30% efficient. Power plants can then generate electricity to drive battery-powered buses, he reasons. "So far as the performance of electric buses is concerned, the only thing that has to be improved is the range," he says. "At present, it is around 90 miles between re-charges: but the energy density of the batteries is improving at a rate of 2–5% annually." TE