

Given the cost savings and efficiency improvements now claimed for green technologies, running cleaner commercial vehicle fleets ought to be increasingly attractive. But with the transport industry largely still to be convinced, the Cenex LCV2013 low carbon vehicle event – staged early in September at the Millbrook Proving Ground in Bedfordshire – provided a useful opportunity to sort myth from reality.

This is now high-profile stuff: opening the event, transport minister Norman Baker claimed that, by 2050 “every van on the road will be an ultra low emission vehicle”. And in three decades’ time, “zero emission transportation will be the norm”. He may even be right: while the government has pledged seed support for green transport technologies, with grants and investment initiatives via the TSB (Transport Strategy Board), elsewhere around LCV2013 there was plenty of evidence of companies also going it alone.

One solution the Coalition clearly believes in comes courtesy of a collaboration between The

Green cost-cutters

Dearman Engine Company, proving ground MIRA, Loughborough University and Air Products. The quartet, helped by a TSB grant, set out plans to build and test a liquid air engine, using liquid nitrogen on a refrigerated vehicle to provide zero-emission cooling, as well as power.

Cool savings

By replacing a conventional engine, the consortium claims that 90% of CO₂ emissions will be eliminated. And, given that cooling accounts for around 20% of a refrigerated truck’s fuel consumption, and a liquid air engine will cost around £3,000, the consortium believes its technology offers a payback of just 12 months.

Alongside fuel, another major cost for transport fleets is tyres, and UK company WheelRight believes it can cut costs on both fronts with an innovative approach to tyre monitoring – potentially saving billions of pounds. Instead of being placed inside the tyre, WheelRight’s monitoring technology



With low-carbon systems for commercial vehicles developing faster than ever, Millbrook’s Cenex LCV2013 event provided an invaluable opportunity to catch up. John Challen reports

is housed in a road-mounted pad embedded where vehicles enter and/or leave a facility.

As a vehicle drives over the pad, in-motion monitoring of pressure and temperature takes place, while the unit calculates vehicle weight and axle load. This information is delivered to drivers instantly, eliminating the need for manual checks and so reducing valve damage, while increasing uptime. The company didn’t divulge prices, but suggested that vehicles running on the correct tyre pressures could save 2% of fuel and 10% of tyre costs. For a 40-tonne truck travelling 100,000 miles a year, that’s a lot of money.

Moving on, Torotrak’s variable-drive supercharger has won admirers in the low-carbon commercial vehicle world for some time, thanks to its ability to improve engine efficiency and reduce fuel consumption. At LCV2013, the company revealed its second generation technology – a 50mm shorter, 2kg lighter version disarmingly dubbed V-Charge V2 – which further improves

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Norman Baker





Millbrook's PEMS (portable emissions measurement system) on a demonstration new-generation London bus. It measures HC, CO, NO, NO₂, NO_x, O₂ and CO₂

efficiency and offers a greater drive ratio spread.

Use of an electric oil pump, in place of a conventional mechanical item, reduces the power consumed in lubrication from 1kW to 30W. The increased ratio spread, meanwhile – from 6.25 to eight – allows an even greater power boost at lower engine speeds. Incidentally, the variable drive in the V-Charge system allows the supercharger to increase engine torque from zero to 95% in less than 400msec – some 70% faster than other single turbocharger technologies.

On the buses

As for PSVs (public service vehicles), one of the initiatives at the Millbrook event was the proving ground's very own portable emissions measurement system (PEMS) on a demonstration new-generation London bus. Using equipment from Sensors Inc, Millbrook's PEMS can measure HC, CO, NO, NO₂, O₂ and CO₂ in real time, while two NO_x modules evaluate emissions pre- and post exhaust after-treatment.

The unit can be used to test a wide variety of engine sizes and, as well as gasoline and diesel engines, it also accommodates drivelines using LPG (liquefied petroleum gas), CNG (compressed natural gas) and other alternative fuels. Millbrook says an advantage of using the system on its own test tracks is the repeatability of drive cycle evaluations.

In a similar vein, among vehicle performance assessment solutions being discussed on the Ricardo stand were its Total Vehicle Fuel Efficiency offerings. Case studies showed, for example, how Ricardo helped one truck operator gain a 25% fuel economy advantage through a mix of driver and operator training, as well as enhancements to the vehicle and its fuel systems.

Meanwhile, Emissions Analytics, which made its name in the car market, is now aiming to gather data from the commercial vehicle sector and provide fleet operators with benchmarks. In addition, as part of a two-year project – led by Howard Tenens, and including John Lewis and Lenham Storage – the company is to analyse six truck-trailer combinations, powered by a CNG/diesel dual-fuel. It will evaluate the vehicles

once or twice every quarter – using CMS SupaTrak telematics to get a detailed picture of how the conversions are affecting performance. Testing is due to begin in January.

Incidentally, returning to Ricardo, there were hints that its next-generation Revolve electric vehicle range extender programme is well underway. The automotive consultancy confirmed that several new efficiency solutions are being investigated on passenger cars that are likely to be applicable to the LCV industry.

Continuing the powertrain theme, Tier 1 supplier Bosch was keen to promote two technologies at LCV2013 that it believes will save fuel and improve performance respectively. First up was its eClutch, which aims to close the gap between manual and automatic transmissions. The system allows drivers to select first gear without using the clutch, and also offers an automatic coast mode, which disengages the clutch, if it detects no throttle input. The German supplier insists that the system can help improve fuel economy by up to 10%.

Its second innovation is the iBooster, which increases braking power in hybrid and electric vehicle applications. The unit recovers almost all energy lost in typical braking operations by ensuring deceleration rates of up to 0.3g are achieved using the electric motor alone. Should extra braking by required, the iBooster generates additional pressure, using the brake master cylinder.

Staying with the regenerative braking theme, hybrid drive systems developer Magtec claimed that its systems provide fuel savings in excess of 40%, while also reducing emissions and cutting maintenance costs. Part of the fuel saving comes from buffers that store energy during vehicle braking – that energy then being used in acceleration, so reducing engine load. Magtec uses super capacitors on vehicles up to 26 tonnes gvw, with peak power up to 300kW. The firm also offers everything from traction motors to battery chargers, and Magtec says it is happy to work with clients to specify their battery systems and controls to optimise performance.

At a simpler level, real-life experience from the London Borough of Redbridge was in evidence at LCV2013 by way of a dynamic throttle control from Zeta Automotive. Since switching its mixed fleet of coaches and minibuses to EconoSpeed electronic control technology, Redbridge says it has improved fuel economy by an average of 11% – and reduced engine and drivetrain wear. EconoSpeed limits a vehicle's acceleration, forcing gear changes to be made earlier, and limiting rpm and top speeds. Experience shows that it eliminates over-revving, and also improves driver and passenger comfort. The retrofit system can be installed in under an hour and Zeta says that some customers have made efficiency gains of more than 15%. 

