

Concept to reality

For this second part of our IAA Hanover CV event review (*TE*, October 2016, page 12 for part one) we focus on new trucks, vans and buses – mostly powered by alternative fuels – that grabbed our attention. Taking systems first, however, astute observers were impressed with VW's first 'open', cloud-based connectivity platform – apparently designed for the entire industry, including competitors – promising barrier-free supply chain information flows.

Dubbed RIO, the system is far more than a telematics package, instead combining information from tractors, trailers, bodies, drivers, orders, scheduling systems, etc, as well as traffic, weather and navigation data. Algorithms currently being developed will then offer analysis and transport re-optimisation.

"RIO will fundamentally change the world of transportation," insisted Andreas Renschler, CEO of Volkswagen Truck & Bus. "For the first time, our platform enables the registration, management, and integrated use of all data available. That is beneficial for our customers because it makes them more profitable. And it is good for the environment, because we will see fewer empty trucks."

VW-owned MAN is the first sponsor. "What we can see emerging here is a platform where each user will benefit individually – regardless of the fleet [composition], which vehicle and body is carrying the sales order, and which logistics software is used," said Joachim Drees, CEO of MAN Truck & Bus.

As of spring next year, he said, new MAN trucks, will all be equipped with RIO as standard, while Scania operators will

In this second of our two-part IAA commercial vehicle event review, Brian Tingham, Peter Shakespeare and Steve Banner examine some of the show-stoppers

be invited to connect on request. Indeed, using a retrofit box, any vehicle might be integrated, said Drees. "Logistics 4.0 can only succeed if artificial barriers and data islands are overcome. That is why we are making every effort to support the development of RIO," he explained.

Moving on to concept trucks, there were several. Iveco's Z Truck was among

the most striking, billed as a totally sustainable transport system and the subject of 29 patents. Designed to minimise operators' carbon footprints, it harnesses a 460bhp, 2,000Nm LNG (liquefied natural gas) engine that can run on biomethane stored in new SAG-built conformable tanks, delivering a claimed 2,200km range. What's more, it sports





a Rankine cycle waste heat recovery system, while completing the driveline is a 16-ratio automated transmission.

Z Truck is not designed for fully-autonomous driving. Instead, all round sensors provide the foundation for the raft of driver assistance. As for driver comfort, the seat, steering wheel, pedals and console are suspended independently from the cab, while driver information is projected on to the windscreen. Meanwhile, the cab interior can also be reconfigured automatically, with the back wall sliding back 500mm to increase the living space when relaxing or using the cab as an office.

One observation: while packed with new ideas, not all of them are practical. Drivers enter and exit the cab via a pop-out staircase, which is good for safety, but would be impossible to deploy were Z Truck to pull up on a ferry or at a tightly-packed truck stop.

Moving on, Mercedes-Benz extolled the virtues of battery power for local distribution, with its 26-tonne concept Urban eTruck. This can achieve a 125-

mile range between recharges, thanks to a 212kWh, three-module lithium-ion battery pack. Regenerative braking helps keep the latter topped up. A smaller battery pack can be fitted to increase payload, but at the expense of range.

DRONES AND ROBOTS

Fancy having your parcels delivered by drone? That might be feasible if you live at the top of a narrow, twisting road that is difficult to negotiate. So said Volker Mornhinweg, global head of Mercedes-Benz Vans. He was announcing Vision Van, an electric Sprinter-sized concept LCV with a 75kW drive, a docking station for a pair of drones on the roof and space in the load area for small, wheeled delivery robots. "Our vans will become mother ships with drones and robots swarming out," he explained. Vision Van offers a range of 70 miles and is controlled by the driver using a joystick.

Ascending the weight scale, MAN displayed a concept battery-powered urban tractor based on its TGS 4x2. Three 35kWh lithium-ion batteries sit above

the front axle, powering a 250kW electric motor. Projected ranges between battery recharges are 30–95 miles, depending on application.

Elsewhere, DAF's Innovation truck was again about next-generation technologies, such as hybridisation and electrification. "Additional features under development include waste heat recovery and predictive, connected and collaborative driving, as demonstrated during the European Truck Platooning challenge earlier this year," said director Ron Borsboom.

Turning to trailers, Mercedes and Krone debuted the latter's aerodynamic Profi Liner Efficiency curtainsider. Side skirts, a four-part rear wing that projects 500mm and low rolling resistance tyres have helped cut fuel usage by more than 5% in trials with German hauliers. Marry this to an Actros OM 471 with similar tyres and PPC (Predictive Powertrain Control, and the saving could be nearer 20%.

Helping drivers without turving them out was well illustrated by Mercedes-Benz's Future Bus (p17). Based on the Citaro, this is a 12m single-decker fitted with CityPilot, which includes GPS, short- and long-range radar, and a dozen cameras sweeping both the road and the surrounding area. If pedestrians wander in front, CityPilot brakes automatically. It also communicates with traffic lights while bringing the bus to a halt at stops, and opening and closing the doors.

While Daimler is developing battery buses, it is not neglecting other alternative fuels. It chose Hanover to launch a Citaro driven by a 7.7-litre



CNG (compressed natural gas) engine, capable of running on landfill gas, too. Its gas tanks are mounted on the roof.

For China's BYD, however, battery power is the only show in town. It gave what it says is the world's first electric sightseeing coach its show debut. A 12-metre, 51-seater, it offers a range just shy of 90 miles, operating in an urban area fully-laden and with the air-conditioning on. That rises to 125 miles with the aircon off.

"City authorities across Europe are increasingly focusing on emissions from diesel-powered sightseeing coaches," contends BYD Europe managing director Isbrand Ho. "Our new model addresses their concerns and provides them with a cost-effective and practical solution."

BYD electric buses look set to become a more familiar sight on UK high streets. The company is working with ADL, and the two recently announced that 51 BYD/ADL Enviro200 EVs are now joining Go-Ahead London. These marry ADL's Scottish-built aluminium E200 body with a BYD drivetrain and chassis.

Back on tractors, and tucked away in a corner of Volvo's stand was one of the few new real-world vehicles on display - a lightweight Volvo FM for urban distribution and payload-critical operations. It wasn't in the limelight: Volvo reserved that for its record-breaking 'Iron Knight' race truck and the Volvo Concept Truck, claimed to reduce CO₂ emissions of a heavy truck by 30%. Nevertheless, the new FM 4x2 tractor weighs in at 5,940kg. Powered by Volvo's 10.8-litre Euro 6 (Step C) D11 engine, it features a new ultra-lightweight rear axle, lighter chassis and low height sleeper cab.

Engine enhancements include low friction pistons, a higher performance turbo and improved profile camshaft, as well as software updates and higher compression ratio that contribute to fuel reduction.

Meanwhile, sister company Renault Trucks highlighted improvements to its T range long-distance trucks around the chassis and driveline, resulting in fuel consumption reduced by a claimed 2%. Weight savings also increase payload by up to 114kg, while Renault's Optivision GPS-based predictive cruise control offers further economy.

Also on the Renault stand was its OptiTrack hydraulic drive, now available on the C Range for 8x4s (with the DTI 11 and 13 engines) and 8x2*6 (with DTI 11 engine) configurations. Like others' offerings, OptiTrack gives vehicles additional temporary traction via hydraulic motors in the wheel hubs of the second front axle. Could be useful where the drawbacks of conventional double-drive systems - fuel consumption, weight, loading height and maintenance costs - rule them out.

Renault also announced that its 2.8- to 4.5-tonne Renault Master van is now available with a Euro 6 engine range, with outputs of 110 or 170bhp. The 3.5- to 4.5-tonne Renault Maxity also gets a choice of two Euro 6 DTI 3 engines delivering 130 or 150bhp. **TE**



Engine developments

Cummins revealed its next-gen Euro 6 X Series heavy-duty truck engines. With 15- and 12-litre displacements, these share a platform with the X15 and X12, recently launched for the North American Class 8 truck market to meet the US EPA 2017 greenhouse gas regulations. Euro 6 versions retain the same fuel efficiency and power outputs as their EPA counterparts.

X12 claims the highest power to weight ratio in its class. Rated from 350–500bhp, it provides up to 2,305Nm of torque at 1,000 rpm and uses Cummins XPI fuel system. Engine weight is below 930kg due largely to its sculptured block design. Further weight has been saved through the use of high-strength composites for the sump and valve cover.

As for the X15, there are two applications. For general haulage and regional work, the X15 Efficiency Series is offered with 400–500bhp optimised for fuel economy. Torque is up to 2,508Nm. Add the firm's Adept SmartCoast and Predictive Cruise Control, and a 6% fuel economy uplift is claimed.

Meanwhile, the X15 Performance Series, rated from 485–605bhp, is aimed at heavy-duty and long-distance work. Peak torque of 2,780Nm is delivered across a wide rpm range, reducing transmission shifts. Engine braking delivers over 450bhp of retardation at 1,500 rpm and up to 600bhp at 2,100 rpm. To meet Euro 6, X15 uses Cummins' single module after-treatment technology.

Cummins also announced Euro 6 engine compatibility with hydrotreated vegetable oil (HVO), renewable diesel and other EN 15940 paraffinic fuels.

Finally, though, a word of warning from MAN concerning second-life Euro 6 DPFs (diesel particulate filters). MAN sales director Ian Mitchell warned that while these are not causing OBD (on-board diagnostics) issues on first-life trucks, second-life owners could catch a cold if the previous owner was not diligent.

"We believe that, over the next 18 months, we will start to see issues with DPFs on second life Euro 6 trucks. While the truck is operating normally ... the condition of the DPF can be out of sight and out of mind. But for vehicles used mainly on regional work, with start-stop operation in heavy traffic, the toll on the DPF is far greater. Buyers of used Euro 6 trucks must bear this in mind - or face a potentially hefty bill [replacement DPFs cost £4,000–5,000] for a new DPF," he advised.