

ROUGH WATER; STRONG CURRENTS

Using an ambient boxvan vehicle as a starting point, we will examine the range-payload compromises of the trucks currently available in the UK market.

There are two major factors to note: one is that the UK's status as a right-hand-drive market outside the EU means that some offerings shown in mainland Europe are not yet available in the UK. The other is that, just as with diesel trucks, power consumption and therefore range are subject to a wide range of variable external factors.

The operation of electrical accessories such as tail-lifts, cab climate control, plus ambient temperatures, the nature of the route and the driver's mastery of techniques such as freewheeling and regenerative braking will all impact on vehicle performance. In fact, as with diesel vehicles, the operational variations encountered in real life may have a greater impact on performance than differences in vehicle specs quoted on paper.

It should also be remembered that this is new technology, with advances being made all the time. For instance, Volvo e-trucks built now have third-generation batteries offering considerable performance advantages

There is increasing pressure, particularly in historic cities such as Bath and Oxford, for deliveries to be carried on so-called zero-emissions vehicles. With this in mind, Richard Simpson reviews what's currently available in the 16-19t gvw battery-electric rigid truck market

over the second-generation batteries found in demonstrator vehicles that were used in the UK last year.

In terms of the UK market, the leaders in electrification in the two-axle heavy rigid sector are DAF, Renault Trucks and Volvo. A third-party conversion on 'glider' chassis built by another manufacturer is also available, as is a novel entrant featuring a low cab with centre-line driving position and integrated freight body. Another new entrant not featured here for weight reasons is the 7.5t Tevva (see www.is.gd/elozuy).

HAS THE E-TRUCK'S TIME COME?

The history of almost any business sector is littered with the corpses of 'early adopters' who jumped the gun and did too much, too soon, and dinosaurs who left it too late to change.

A hard economic case for the straight replacement of diesel with electric trucks is difficult to make at the moment, as operators face not only the high capital costs and operations restraints of switching to battery power, but also relatively costly electricity and the

need to install suitable charging infrastructure.

Only a minority of transport businesses will operate from a freehold depot with a sufficiently good electrical supply to support the charging of an electric fleet already in place, and there is little point in installing expensive infrastructure at a leased premises unless some guarantee or support can be obtained from the landlord. And it's painfully obvious that selecting electric vehicles without proper infrastructure support is not a wise decision.

That said, there are two factors which can swing the decision in favour of e-trucks. One is when the customer (including the internal customer on own-account fleets) is under some pressure to reduce its environmental impact, whether that be carbon emissions or toxic fumes, and will pay a premium for this. And the other is where vehicles must enter one of the small but growing number of zero-emissions zones.

Where electric trucks are introduced, operators must be prepared to recast their routes to gain maximum benefit from regenerative charging. In simple terms, trucks should leave the depot fully charged, and tackle the toughest part of the route before harvesting 'free' energy on the return journey. Uphill out, downhill back. Fleet engineers may have to explain the reasons for this to the operational side of their company. **TE**



RENAULT TRUCKS

The Renault D (narrow cab) and D Wide (full-width cab) E-Tech trucks have a gvw of 16.7 tonnes including the dispensation for alternative fuels.

A single 185kW (130kW peak power) electric motor in the D E-Tech draws on battery packs varying in size from 200 to 565kWh, allowing Renault Trucks to claim a range of up to 560km. A payload of up to 11 tonnes is claimed.

The D Wide E-Tech has a gvw of 19 tonnes in 4x2 form. Twin motors yield 260kW of continuous power, with a maximum output of 370kW. Battery packs from 200 to 375kWh can be specified, with a claimed maximum range of up to 315km. Payload for the truck in 4x2 form is unstated.

There are various charging solutions for the E-Tech trucks. The standard provision is for up to 22kW AC for overnight charging, with a capability for transferring 265kW in less than 10 hours. Connected to a 150kW DC charger, full charging time is reduced to less than two hours.



DAF

Taking advantage of the one-tonne gvw allowance for alternative-fuel vehicles, DAF offers a 19-tonne LF Electric distribution truck. The LF Electric has a 260kW (370kW peak power) electric motor powered by a 282kWh (252kWh effective) battery pack giving a range of up to 280 kilometres. Body and payload allowance for the chassis-cab is 11.7 tonnes. A 20% to 80% charge from a 400V AC three-phase supply takes six hours and 30 minutes. Where a 650V DC 150kW charger is available, batteries can be charged from 20% to 80% in two hours. (See also p23 for a profile of a new, though diesel, rigid.)

VOLVO TRUCKS

The Volvo FLe electric 4x2 has a gvw of 16.7 tonnes, and has a typical cab-chassis weight (with short sleeper cab) of 7.44 tonnes when fitted with four batteries weighing 520kg each, giving a body/payload allowance of 9.26 tonnes. In Generation 3 form, these batteries each have a capacity of 90kWh/h, giving a total capacity of 360kWh/h. Buyers can specify between two and six batteries. With Generation 2 batteries, the same truck has a range of 200km fully laden. Volvo says the more recent batteries could extend this by up to 40% without payload penalties.

In any case, a single 130kW (continuous) motor drives the truck, and charging times range from 11 hours with 22kW AC power to two hours with 150V DC power for a full charge.

VOLTA TRUCKS

NEW ENTRANT

Volta offers a novel design with a central driving position and integral body at 16- and 19-tonne gross weights.

Power is provided by an integrated Meritor 14Xe e-axle, which is available at rated outputs of 150, 180 and 200kW, with a peak output of 250kW in all cases.

Twin battery packs of a total of 150kWh capacity yield a range of 150km, with the addition of a third pack extending this to 225kWh and 200km. Volta Trucks is cooperating with Siemens Smart Infrastructure to provide a comprehensive charging infrastructure for customers.

Claimed payload is 8t for the 16-tonne version. Initial orders for 300 trucks are in-build now for selected customers.



SPECIALIST CONVERTER

ELECTRA

Based on the IVECO Eurocargo chassis-cab, this truck is offered at gross weights of 12.5, 14, 16 and 19 tonnes. A traction motor delivers continuous power of 260kW and peaks at 350kW. Battery packs come in capacities of 140kWh, 205kWh, 225kWh and 287kWh. The recharging time for a 205kWh vehicle is approximately five hours at 44kW. At 19 tonnes gvw, and with a 205kW battery pack with twin chargers, a payload loss of just 360kg over a diesel 18-tonner is claimed.

