



# ON A CHARGE!

**T**he higher front-end price of electric city buses is no barrier to their introduction to fleets, says Ian Downie, head of Yutong sales at UK importer Pelican Engineering. Operators should not be deterred by the initial price, which he admits can be twice the cost of a diesel equivalent, because running costs and downtime are so much less, he asserts. In fact, the initial outlay can be reduced by 40 or 50% by leasing the battery while purchasing the bus outright.

A similar mechanism has been used by Renault Group in the passenger car market. Renault Zoe drivers can opt to lease batteries for a monthly, mileage-dependent, fee to reduce the up-front purchase cost of the vehicle. Downie points to Zenobe as having been a successful partner for Yutong customers in the UK.

"Zenobe offers 'battery as a service', meaning battery costs become an operating cost, not a capital cost. But even including the battery price in operating costs, our electric buses remain cheaper to operate than a diesel equivalent."

## Richard Simpson finds out how battery leasing can reduce front-end costs and uncertainty as bus fleets transition to electric power

One obvious factor is a government subsidy: a grant of 22p/km for operating an electric bus, as opposed to just 6p for a diesel. "Then there's the greater energy efficiency. A diesel bus will do 8-10mpg; the energy equivalent for an electric bus is 20 to 25mpg."

In terms of well-to-wheel CO<sub>2</sub> emissions in the UK, there's a 77% improvement over a Euro VI on the current power generation mix, and this will improve as more renewables are added to UK capacity.

"From a local environment point of view, there are of course zero toxic tailpipe emissions. Effectively, this future-proofs the vehicle and enshrines its residual value. With zero emissions from an electric bus, there is no danger of legislation forcing premature replacement."

### SERVICE LIFE

Just how long the service life of an electric bus might be is of key importance. The capital costs are higher,

but the running costs are lower - so the longer the vehicle's life, the more money can be saved.

And this is where the electric bus has an ace up its sleeve. The inherent simplicity of the electric driveline has beneficial consequences for the life of the vehicle, and these increase, in comparison to a diesel vehicle, as it ages.

"Temperatures in the engine bay of a diesel bus can be as high as 140-170°C, and this eventually degrades electrical components and wiring. In contrast, temperatures around the motor of an electric bus are about 60°C. There's virtually no vibration to speak of compared to a four- or six-cylinder diesel, and that aids component life.

"The maintenance requirements are far less: there's no engine oil or filters to change, for a start. There's also no gearbox oil, but the rear axle is conventional and needs a change every three or four years, just as diesel buses' do.

***“We are confident in the durability of electric vehicles. The batteries are guaranteed for eight years, and the actual vehicle life will far exceed that, helping further reduce the total cost of ownership”***

Ian Downie

“The air compressor and power-steering are all electric, so there’s no potential issues with oil from the compressor being carried over into the air system.”

So what routine work does an electric bus actually require? Downie replies: “Suspension, brakes and steering all require inspection and maintenance, the same as a diesel bus. However, brake wear is generally less, as regenerative braking does a lot of the retardation. In terms of the powertrain, the most important task is ensuring all the power cables are properly torqued up. There’s a simple process involving removing two fuses in the energy compartment and giving the system time to power down before touching any of the orange high-voltage cables, but it is easy to work on.

“We train our customers’ technicians to work on the vehicles during the warranty period. It’s something they are generally keen to embrace, as the work is clean and there’s a feeling that zero-emissions vehicles are the future. We are also helping build a skills base in the areas where our buses operate.

“The Yutong has another advantage: it’s an integral product, rather than being a vehicle with a chassis built in one factory and the body in another. This means that maintenance accessibility is designed in.

“I’d also contend that it’s a more durable product because of this. Yutong has been building electric buses since



1999, and there are 133,000 in service in 100 different countries around the world.

“When a new model is introduced, the first one is put through the equivalent stress of a lifetime of work on a rig in just five days, then further vehicles are subject to a full programme of track testing before anything is put into customers’ hands. In contrast, small-scale producers can spend three years debugging the first vehicles to reach customers.

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**...AS A SERVICE**

Zenobe offers far more than finance for batteries, describing its offering as Electric Transport as a Service (ETaaS). It works with bus operators and the relevant local authorities to plan and provide suitable charging facilities for electric fleets. Charging infrastructure, battery replacement and management

software are all included in the service.

The initial high front-end cost of the batteries can to a certain extent be offset by their residual value, in much the same way that happens when a new vehicle is leased.

Batteries whose capacity has been depleted by about 20-25% may no longer have sufficient power for mobile applications, but they can still store enough power for other uses.

Ironically, the first of these in the UK is to be found in a bus depot! National Express Group, which has already announced that it has “acquired its last diesel bus” has had 10 ADL Enviro 400EV-bodied BYD battery-electric buses operating between Coventry University Hospital and the city centre since August 2020.

Zenobe installed a ‘turnkey’ charging station at National Express’s Coventry depot, including 10 charging points for the electric ‘deckers’. It took second-life BYD bus power cells from Nordic countries and built them into a stationary battery of 1.2MWh capacity to store electricity on-site at the charging centre, and smooth out peaks and troughs in the demand for grid power.

Even when this second life is over, Zenobe claims the majority of materials contained in a vehicle battery can be recycled back into battery manufacturing. [IE](#)

**FIRE SIDELINES SWITCH E-BUSES – TEMPORARILY**

Manufacturer Switch Mobility briefly ordered its Metrodecker EV buses off the road as a precaution after a fire involving two of the vehicles at Metroline’s Potters Bar depot, in which a total of six buses were destroyed. A statement from the manufacturer said: “Safety is paramount to Switch, and as a precautionary measure we have advised operators not to charge or utilise vehicles that use the same battery technology as the vehicles involved while investigations continue.” A total of 108 buses operating on the Transport for London network, along with 21 Metrodecker EVs from First York’s park & ride network, were taken out of service for safety checks, but they were back in service last month after receiving the all-clear (see also p8).

