

COOKING

Dual fuel has more than merely caught the attention of the big boys. Brian Tingham talks to DHL, TNT and Sainsbury's about their major truck conversion programmes

Following last month's second feature on dual-fuel technologies, big names have announced large numbers of truck conversions, all for mainstream transport. And not only do all of them claim to be saving on fuel costs – generating respectable returns on their investments, while helping to save the planet – but they also shed useful light on what makes sense.

DHL Supply Chain now has a total of 101 LNG (liquefied natural gas) and diesel tractor units in the UK, and another 51 on order, making its by far the largest publicly-declared dual-fuel HGV fleet in the UK. All are Volvo 6x2 mid-lifts – a mix of FM 460s (specified with the GTXL cabs) with Volvo's factory-fit version of Clean Air Power's dual-fuel system, but also DHL's preferred Volvo FH 460s equipped with CAP's own aftermarket conversions.

But this logistics giant is far from alone. TNT Post has converted 80 of its 120-strong fleet – all Renault Premium 460 Euro 5 6x2 mid-lift tractor units – to LPG (liquefied petroleum gas) and diesel, using Prins Autogas UK. Meanwhile, Sainsbury's has extended its dual-fuel fleet (also Euro 5 Volvo FMs, with CAP conversions) to 58 trucks, in its case running on diesel and LNG – as a 50/50 mix of regular and biomethane, for improved green credentials.

DHL passed its century with the conversion of 63 new trucks at its flagship consumer and life sciences distribution hub, in Bawtry, Yorkshire, which went live in September. These added to an existing dual-fuel fleet comprising 27 in Scunthorpe, two operating out of Crick (Dirft) and three on temperature-control duty from Wisbech. DHL is also running a further six Volvo dual-fuel tractor units into Europe.

Ian MacAulay, innovation and business development manager with DHL, says the newly converted tractors are hauling semi-trailers in the 40–44 tonne range, double-shifted and averaging 180,000km per year. He also explains that the project was part of DHL's GoGreen agenda, which aims to

reduce carbon emissions company-wide by 30% for 2020, against 2007's figures. Most important, he estimates payback within three years.

"Diesel is a huge focus for DHL globally, but the UK has our largest diesel commercial vehicle fleet – 4,500 tractor units, 3,000 rigids, including tippers, and 10,000 trailers – which contribute 87% of our carbon footprint," he asserts. "And diesel also represents about 75% of the whole life cost of our trucks. The expectation is 10–14% carbon saving running on fossil energy. So that's an annual saving of 1,200 tonnes of CO₂ across the 63 units at Bawtry, equivalent to 5,933 semi-trailers," he adds.

Why LNG, not CNG (compressed natural gas)? MacAulay says it's simply a matter of fuel tank capacity that can feasibly be packaged on a 6x2 mid-



lift. "LNG gives us the energy density for a 650km range on dual fuel, and we have 150–200km diesel fall-back," he states. As for why not DHL's other mainline tractor suppliers – DAF and Scania – MacAulay says that when they offer OEM dual-fuel solutions, he will be interested.

As for the mix of Volvo factory-fit and CAP aftermarket conversions, he states: "We need to understand both technologies, in terms of longevity

ON GAS



DHL's £8.1 million major dual-fuel HGV fleet investment, with its zero-loss LNG refuelling station, will pay for itself within three years – and save carbon

and cost. So we're putting them in the business to get the right balance."

Christina Eriksson, Volvo's business manager for alternative drivelines, explains the main differences: "We doubled the number of gas injectors, from six in the CAP retrofit to 12 in our version, to improve the precision of gas injection control. That allows an increase in the methane substitution rate, so a more efficient solution." And she adds that Volvo has integrated the system fully with its truck's ECU – communicating two-way, rather than read-only off the CANbus – so enabling better dynamic optimisation.

What of experience to date? MacAulay says that torque and power are very well mapped to the original diesel trucks, with an efficiency slip of only 3% on LNG. Overall, he states that performance is comparable, with only a slight drop in power noted on the aftermarket fitment. "Nothing that would cause us any issues," he comments. As for maintenance, he says that, apart from replacing gas injectors every 300,000km, there are no issues. "It's all factored into Volvo maintenance and handled through the network."

Also crucial to the Bawtry project, which cost DHL around £8.1 million, is a state-of-the-art, 'zero-loss' LNG refuelling station, built and operated by BOC. Mark Low, BOC business manager for LNG, explains that it's an automated fast-fill operation, with refuelling

taking "less than two minutes from coupling up to completion", driven by differential pressure (no pumps from the dispenser to the vehicle). He also says that, with telemetry on the LNG vessels, BOC can monitor performance remotely and provide 24/7 support. And he adds that, this being one of BOC's most recent LNG stations, it has full vapour recovery, so that – unlike some older plants that are decidedly un-green – none is vented to atmosphere.

Horses for courses

So, how about TNT Post and its choices? The business case for this massive dual-fuel project was best served by LPG, according to transport director Dean Hulse. "In an ideal world we would have gone for LNG or CNG [since LPG isn't as environmentally friendly], but the infrastructure just isn't there yet and our fleet operates up and down the country," he says.

That said, he points to the much lower capital cost for his conversions, at around £5,500 apiece. "Admittedly, the fuel savings aren't as great with LPG, but the investment is around a quarter of that for LNG. So it nets off quickly [and] it was easy to get up and running, from the depot and gas supply perspectives, too." Indeed, Hulse expects payback well within the year – an estimate backed not only by data from tests at the Millbrook proving ground (which suggested up to 15.5% net on trucking), but

Advice from the big boys

- “Make sure you run tests. You’ve got to know your activity and be comfortable with the numbers. If you’re into distribution for hire and reward and you don’t know how far and where your trucks are going, then it could be tricky. But if you’re a supermarket chain operator trunking between hubs and depots, it’s a much better story. These systems lend themselves well to dedicated networks, rather than general haulage.” *Dean Hulse, TNT Post*
- “We’ve done a lot of interventions already, including speed reduction, specifying fully-automated transmissions and aerodynamic initiatives, but it’s clear that in heavy transport there are very few other options. We believe dual-fuel LNG is the way to go where the duty cycle fits – which, for us, sits around high-mileage, heavy-duty trunking, double-shifted retail distribution and factory collections. CNG and biogas might be better, but, for our range and to avoid heavy mods, the power density of LNG is what we need.” *Ian MacAulay, DHL*
- “Different conversions do different things: dual fuel will work, but how efficiently depends on the operation, the distances and the types of load. Trunking is a good opportunity, but even that depends on the weight you’re carrying. And there are other parameters that, even if you’re not trunking, can make it work very well.” The bottom line: Sainsbury’s is “looking at dual-fuel in a big way” and considering introducing more vehicles into the fleet soon. “It’s one of the keys for reducing emissions as part of our 2020 vision in the transport fleet.” *Gary King, Sainsbury’s*

LPG works best for TNT Post. “In an ideal world, we would have gone for LNG or CNG, but the infrastructure just isn’t there yet,” says transport director Dean Hulse

also actuals of 8% and rising on vehicles converted and live between January and April this year.

That’s not just on motorway work – although TNT’s national transport training manager Jon Sturgess admits that best results come from night trunking depot-to-depot at 56mph. Hulse says that, as long as converted artics are covering “100 miles in one hit”, worthwhile savings can be there. “Total miles per year are irrelevant: it’s the kind of miles that matter,” he explains. “It would have been futile for us to equip every HGV, because the savings on rural start-stop, for example, are minimal.”

Hence the decision to convert around 70% of

TNT’s fleet. Incidentally, Hulse also confirms that his truck leasing deal with Renault has not been affected. “We went through a few hoops over warranties, but there was no issue and, at the end of the lease, we just hand the vehicles back, having removed the [conversion] kits,” he states. What’s more, since those kits can adapt to CNG or LNG, he sees a route for TNT into the next phase – and not only with Renault trucks, but also DAF and MAN in the future.

As for refuelling, the logistics firm worked with its existing gas supplier (for forklift trucks) Flogas, which installed separate LPG stations at TNT’s depots in Iver, Bristol, Rugby, Leeds and Warrington – the latter equipped with a ‘super tank’ to fuel the fleet running into Scotland – all of which were supplied under a litre-price contract. “Bulk tanks vary in capacity across the network, according to fleet size, and we have also installed separate fuel management systems to record the precise flow of gas into our vehicles, so we can track the benefit... Fittings on the gas dispensers are totally different to those for diesel, so drivers can’t possibly get this wrong.”

Running on rubbish

It’s a similar story at Sainsbury’s, which now has: one Mercedes-Benz Axor with a Hardstaff dual-fuel conversion; 50 Euro 5 Volvo FM12 460s with CAP’s Genesis conversions; and a further seven FMs with Volvo’s slightly uprated CAP conversion. All are 6x2 tractors based out of its Emerald Park Distribution Centre, in Bristol, serving stores and depots throughout Wales and the South West.

Like DHL’s MacAulay, Sainsbury’s operations support manger Gary King says the spread of systems is aimed at proving a range of makes and conversion types. He explains that all have been equipped with 100kg LNG tanks as well as a 200-litre diesel tanks, with minimal modifications to the chassis themselves.

“We went for LNG to give us the range that CNG can’t,” he explains, adding that for this back-to-base operation, that’s around 750km. So far, substitution rates are running at more than 56% and, while he can’t release direct savings from that, he does say that the intervention is delivering up to 25% carbon reduction. And he adds: “Put it this way, our investment will pay back over the life of the vehicles and we operate them for up to five years.”

What about any differences in characteristics? There are none, says King, stating that the drivers are hard pushed to tell them apart. And it’s much the same with maintenance – although R&M for the conversion kit is under CAP’s care, with Sainsbury’s only looking after the vehicles themselves.

As for the fuelling station, Sainsbury’s paid for the plant, which was installed by Gasrec, which also delivers the methane. “We went for a pumped solution and we’ve got two tanks storing up to 40 tonnes of LNG,” says King. **TE**

