



Gas charge

Dual-fuel and gas trucks are set for exponential growth as the LNG/CNG refuelling infrastructure sees major investment and as cheaper conversions come on stream.

Brian Tingham examines claims that by 2025 there may be 35,000 gas trucks on UK roads

While growing numbers of hauliers, both large and small, are running trucks converted for dual-fuel diesel and LNG or CNG (liquefied or compressed natural gas), the vast majority are waiting for the two-year TSB (Technology Strategy Board) funded Low Carbon Truck Demonstration Trials to report. Their expectation is that R&D under this £23m programme, being run by Cenex (Centre of Excellence for low carbon and fuel cell technologies), will soon deliver hard evidence on what works, what doesn't and who to approach for best returns.

Those who got stuck in early might reasonably argue that their gamble has already rewarded them with competitive advantage, in terms of costly fuel savings, not to mention shiny green credentials. The others will no doubt point to the pioneers' high-risk investments as good reason for staying well clear. But, either way, with the TSB consortia sporting

names including Argos, Brit European, DHL, Eddie Stobart, Howard Tenens, JB Wheaton, John Lewis, Lenham Storage, MIRA, Müller Wiseman Dairies, Tesco, United Biscuits, Waitrose and Wincanton – as well as LNG/CNG specialists BOC, Chive Fuels, CNG Services and Gasrec, plus most of the dual-fuel converters – this is looking big.

Huge investment

So what's going on? Well much more and far faster than anyone could possibly realise – which is no surprise, given most TSB project leaders' reluctance, until now, to talk. Indeed, Cenex's first project seminar, staged late in January at the Heritage Motor Centre, was a real eye opener that left delegates buzzing with the prospect of an impending transport revolution fuelled by resurgent natural gas.

And the words 'impending' and 'revolution' are not too strong. Why? First, methane availability is now ramping up surprisingly fast: large numbers of

Dual-fuel trucks are gaining ground as LNG's refuelling infrastructure sees massive growth



LNG/CNG refuelling stations go live this year; the massive Grain LNG import terminal in Kent comes on stream next; and UK biogas and natural gas liquefaction plants are also in the pipeline. Secondly, with the favourable fuel duty differential between natural gas and diesel fixed for a further 10 years, the cheap, clean fuel argument looks robust.

Thirdly, not only are dual-fuel conversions forecast to fall in price with growing demand, but also advanced, diesel-initiated Euro 6 gas trucks are due out this year. First up is likely to be Volvo at around the perfect 450bhp trucking power, with 95% methane substitution (unconfirmed) widely rumoured. These will add to conventional spark-ignition gas trucks from the likes of Iveco and Scania, which are now coming in at Euro 6.

Iveco will have Euro 6 136bhp gas Daily vans and chassis cabs, 3.5–7.0 tonnes, and gas Stralis trucks, 270–330bhp (as 4x2 and 6x2 rigids, and 4x2 tractors) in Q2 this year. Euro 6 gas Eurocargo rigids at 200bhp will follow in Q4 as 12- and 16-tonners. Scania already offers its Euro 6 9.3-litre, 340bhp gas engine tractors: in fact, five are being delivered to Argos under the TSB's Magna Park consortium trial.

So if the pundits are right, we're looking at dual-fuel and gas trucks moving from a niche activity not only to become mainstream, but potentially even to dominate freight transport, possibly within the next decade. Indeed, bio-LNG (BNG) manufacturer and supplier Gasrec – which already owns and operates 11 LNG/CNG refuelling sites around the UK, including its flagship DIRFT (Daventry International Road Freight Terminal) station – reckons that by 2025 there will be between 15,000 and 35,000 gas trucks on UK roads. And enlightened fleet managers, such as Sainsbury's Gary King, believe those figures are probably conservative.

Time will tell. Meanwhile, fleshing out some of the TSB projects' detail, 13 consortia are involved, with



trials due to conclude in December 2015. Between them, they will run fleets on dual-fuel CNG and/or LNG, as well as gas or used cooking oil (United Biscuits). Some are also building gas refuelling stations around the UK – 26 in total, of which 13 are new open-access sites, mostly L/CNG (offering liquefied and compressed gas). Others are trialling next-generation, lightweight aerodynamic semi-trailers as well. Supporting them all are most of the truck OEMs, as well as many of the dual-fuel converters, telematics firms, university engineering departments and consultancy Atkins, which is doing the number crunching.

1,000,000km per month

When fully operational, the trials will boast 354 low-carbon trucks – 339 dual-fuel, five dedicated gas, and 10 cooking oil – as well as 18 low-carbon trailers. As of last month, 175 trucks had been deployed, along with all of the trailers and four of the refuelling stations. “Our low-carbon trucks are already covering 1,000,000km per month and have so far consumed 900,000 litres of diesel, 527 tonnes of methane, 41 tonnes of biomethane and 48 tonnes of cooking oil,” states Chris Walsh, head of technical support at Genex. “So we’re quickly getting very large amounts of useful data.”

Looking at the detail, the vehicles are averaging 820km per day, with gas substitution rates of 40–80% and a mean so far of 50%, but trending upwards as the gas infrastructure and reliability of supply improve. Walsh says that, although there have been teething issues with some of the conversions, those have now been solved, and the trial trucks are very much on track. People like them, too: “According to the drivers, dual-fuel trucks are slightly better than they thought they would be, in terms of performance and noise, and slightly better than diesel: 80% said they were proud to drive them.”

So will they take over? There has been much talk about Euro 6 halting dual-fuel and gas engine developments. But, if dual-fuel pioneer Hardstaff is anything to go by, technical problems are being exaggerated. The firm says it is currently working on



a Euro 6 dual-fuel conversion platform for the new range of Mercedes-Benz engines, with product availability due in Q3 this year. Hardstaff concedes that the engines are very different to the German OEM's Euro 5 power plants, where its experience lies, but says they are also more controllable and offer more opportunities to deliver improvements, in terms of efficient gas substitution rates.

Bureaucracy versus engineering

That said, Steve Whelan, technical director with Hardstaff competitor Clean Air Power, explains that remaining hurdles in the way of all-out gas adoption have more to do with bureaucracy than engineering.

"The biggest issue is methane tail pipe emissions, which are [stipulated at] 0.5gm per kWh for dual-fuel systems. That, coupled with the new World Harmonised Duty Cycle – which is more like a light-duty cycle, so not representative of heavy trucks – means it can be hard to match. But that's only

because methane is listed as a pollutant, which it's not. It's a greenhouse gas. So the emission limit has been chosen without any basis in science or sense. And the irony is that, if you run dual-fuel trucks, you're reducing pollution and greenhouse gases, because they're inherently lower carbon."

What about those costs? Well there's no denying that low-carbon trucks today are expensive. For dual-fuel, you'll need to add circa £20,000 to the list price – although, as stated, that will fall – and you'll pay a surcharge for gas trucks, too. But, as Iveco product director Martin Flach says, that's mostly about production volumes. "At parity of volume, gas engines would cost less than diesel. The bit we can't influence is LNG tanks, which are expensive." However, again, as the business opportunity becomes clear, competition will force prices down.

The timing may be debatable, but it now seems crystal clear: we are on the cusp of a gas-fuelled transport revolution. **TE**

Massive new methane supply

What about that gas supply? Ed Carter, commercial development manager at National Grid's Grain LNG terminal, says this year and next will see the tide turn. Conceding that its 30-year-old Avonmouth site (the last remaining large-scale gas liquefaction plant) has experienced problems, leading to unreliable LNG supply, he asserts that Grain will change all that. Grain is now the largest LNG importer in Europe, with 1,000,000m³ storage capacity and two jetties capable of docking Q-Max vessels (the biggest LNG ships on the planet) – meaning it can shift 15 million tonnes of LNG per year.

Most important, the giant site is within days of an investment decision that will see a two-bay loading facility built, designed to handle 36 LNG road tankers per day (with provision for double that) for refuelling stations. "Construction starts in April, with go-live in May 2015 and we forecast 200,000 tonnes of LNG per annum for road fuel," says Carter. And pointing to LNG exports coming on from Australia, North America and elsewhere, he adds: "This will be a huge market."

But it's not just about LNG imports. Indigenous suppliers, including CNG Services, Gas Alliance and Gasrec, are all ramping up provision. CNG Services already supplies CNG and bio-CNG at Crew, the UK's largest public filling station. Other gas plants include Didcot and Poundbury, where it injects biomethane into the grid. Managing director John Baldwin says that 15 new bio-CNG plants will be built this year, with another 20 next, together producing tonnes of gas from waste.

Meanwhile, Gas Vehicle Alliance has a mission statement 'to supply 100% biomethane made in the UK for commercial transport'. Director Phil Lowndes explains that the firm already blends hundreds of tonnes of food waste and slurry, from supermarkets and local farms, at its Crouchland site and produces 2,200m³ of biomethane (1,700kg) per hour. With three more sites this year, supply will not be an issue, he says.

And neither will refuelling stations: "We have six so far and three more planned this year. We do the planning, project management, everything. We supply five- to 10-year fixed-price gas contracts for operators with, say, 10–20 trucks, using 300,000kg of gas per year, with no capital cost for the station." Hence his claim of an 18-month all-up payback.

As for LNG and bio-LNG, look no further than Gasrec. Chief commercial officer Ben Sawford explains that the firm is no longer only about liquefying landfill gas at Sita's site, near Guildford. "We do everything, from producing LNG to sourcing gas from third parties, such as Avonmouth and Fluxsys, transporting that gas and selling it. We have also secured a Ten T [Trans-European Transport Network] grant from the EU to supply five large LNG refuelling stations around the UK. One is DIRFT, which can refuel 700 trucks per day, but others will be built in Livingston, Wakefield, Thurrock and Avonmouth."

Again, it's all about serious numbers and massive ambition, with Sawford agreeing that Gasrec has recently professionalised its business for growth. That shows. Not only is the firm talking about extracting and liquefying natural gas from "stranded [otherwise uneconomical] sources" around the UK, but it is also beefing up its LNG tanker fleet and offering a range of refuelling station types to suit different freight operations.

"This year, our board has sanctioned additional refuelling stations in Hatfield, Southampton, Bridgewater, Solihull, Derby and Warrington. Combine that with what's happening at CNG Services, Chive and others, and you start to see a much stronger LNG availability," says Sawford.

And one last word about that board: ME Zukerman, which specialises in large capital investment programmes primarily in the global oil and gas industry, is now Gasrec's majority shareholder. These people don't mess about.