

# BIOGAS BOOM



Roadgas' David Rix and Jon Harman explain to **John Lewis** the benefits of compressed natural gas – and how they can help operators make the switch

**B**us operators who want to switch to an environmentally-friendly fuel are increasingly opting for clean-burning compressed natural gas (CNG). Among its advantages are lower CO<sub>2</sub>, NO<sub>x</sub> and particulate emissions when compared with diesel. Positive news, given mounting concerns over climate change and air quality. It is cheaper too.

Purchasing buses that run on CNG is only part of the story. Refuelling facilities and infrastructure are required as well – and that is where Nottingham-based Roadgas can help.

The company can install and commission all types of equipment that may be required to support the supply of biogas, and has done so at some 30 locations of various sizes throughout the UK and overseas. “This includes Nottingham City Transport’s (NCT) Parliament Street depot,” said Roadgas Managing Director, David Rix. “With 53 Scania/ADL Enviro400CBG city buses in service, NCT runs the biggest fleet of gas-powered double-deckers in the world.”

Roadgas Operations Director, Jon Harman, added: “We positioned the gas dispensers next to the diesel pumps in its depot so that it can refuel both types of vehicle in the most efficient way possible.”

Opt for gas, he points out, and you can take advantage of one of the UK’s greatest infrastructure assets: the network of gas mains. Admittedly it does not cover the whole of Britain, with some rural areas missing out, but it is present in most urban areas – and that means there is no need to have gas delivered by tanker.

“Assuming there is a gas main close by

with sufficient capacity, Roadgas can arrange to connect to it and carry out any ground works that may be necessary for access,” Jon explained.

The Roadgas team will install a compressor capable of compressing the gas to 300 bar and the gas is then held in a small on-site storage tank linked to a dispenser. As the bus is refuelled using the dispenser, more gas will be compressed and enter the tank, providing a cycle of constant supply.

Gas is of course flammable. “Safety remains central to all our operations, and from this viewpoint the precautions you need to observe are the same as those you would take if you are filling a vehicle with petrol or diesel – both of which are flammable too,” said David.

There is no need to don special protective gear or a face mask, although Roadgas encourages the wearing of gloves, a sensible precaution no matter what type of fuel you are dealing with. “It’s simple really. Like using any dispenser, all you need to do is place the dispenser into the bus, press the start button

and it all works automatically,” said Jon. “The nozzle will connect and disconnect without releasing any gas into the atmosphere.”

Unlike diesel, CNG will not leave a slippery puddle near the dispenser, which gradually soaks into the ground if it is not cleaned up. When this happens there is a danger the diesel spill could end up polluting soil and nearby streams and rivers – a major concern to the environmental enforcement authorities.

Furthermore, bulk diesel tanks can potentially leak, creating an even more serious pollution problem, leaving operators facing heavy fines and a big bill for cleaning up the mess. “Filling a bulk tank with several thousand litres of diesel also means you have to pay for it in advance,” David pointed out. “Draw gas from a main, and you pay as you go – good news for the bus company’s cash flow. “It can’t be pilfered either,” he added. “And there is a reduction in vehicle movements because you don’t have tankers going in and out of your premises.”

## What about planning permission?

“We advise and support our customers through the planning process as part of our service and it’s usually pretty straightforward,” Jon said. “We can prepare the application and produce all the necessary drawings. We’re aware of the questions that council planning officers are likely to ask and advise accordingly.”

Fleets that want to run on biomethane as opposed to ordinary CNG can now buy it from any source in advance and remove it at point of dispense anywhere from the grid. Produced naturally from renewable sources such as food waste, farm waste and sewage, biomethane has a particularly good CO<sub>2</sub> story to tell. “It’s made a big difference to CO<sub>2</sub> calculations,” said David.

## So, how expensive is a refuelling installation?

“When considering the use of gas to fuel your fleet, what matters is not the upfront cost of the necessary capital equipment, but the ongoing reduction in fuel costs that can be achieved,” said Jon. “You can cut your fuel bills by approximately 30% compared with diesel.”

The scale of the saving that can be made is heavily influenced by the number of gas buses that will be based at a site; something that Roadgas will discuss with the operator before any installation work is carried out.

“If you’re only planning to run a couple of buses then doing so won’t save you more than staying with diesel,” Jon said. “From an economic perspective, a fleet operator should

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be working towards operating at least 15 to 20 buses for a grid connection to make sense. The more you run, the cheaper it gets. The economies of scale kick in really quickly.”

“As well as discovering what the customer wants today, we also need to understand what the requirement might be in three or four years’ time,” said David. “The handful of gas buses the operator runs now may rise to 40 or 50 or more very quickly if the initial fleet proves to be successful. And the refuelling station will have to be scaled up accordingly.”

There is an alternative to connecting to the grid, and one that bus companies could consider if they have no access to a gas main: having liquefied natural gas (LNG) brought to site by tanker. “LNG is more difficult to deal with because at -130 to -140 °C it is really cold, so if you are handling it you definitely need gloves and protective eyewear,” said Jon.

“It is not dispensed directly into a bus either but converted into CNG at site first – Roadgas provides all the necessary equipment required to make this happen.” Moving LNG by tanker adds to the cost of course, and LNG has to be paid for in advance.

No matter whether the gas comes in by tanker or through a gas main, the facilities installed at the customer’s depot require remarkably little maintenance. “The regulations governing pressurised systems mean that inspections and other tasks have to be carried out, and we like our technicians to visit the site at least once a month or at the maximum once a quarter just to check that

everything is as it should be,” said David.

To maximise reliability, Roadgas is careful to build redundancy into the infrastructure so that equipment will continue to function in the remote event of failure. “If you are relying on gas to keep your buses running then it must always be available,” said David. “We continually monitor facilities to ensure that they are functioning properly, and we provide engineering support 24/7.”

Roadgas was set up in 2007 as an independent business from its parent company, Gas Container Services, with Jon leading the team from the beginning. “Jon and I have both been in the high-pressure gas industry since the early 1990s and have a wealth of experience and expertise,” said David.

“The last eleven years have seen a huge improvement in the quality and capability of gas-powered vehicles,” added Jon. “Back then, independent converters were taking diesel engines, drilling holes in their cylinder heads and sticking in spark plugs – the trend then was for dual-fuel vehicles.”

Today the emphasis is on dedicated gas-only trucks and buses built by manufacturers such as Scania, Iveco and MAN, and the technology has now become well-established. Stagecoach in Sunderland has been running gas-powered single-deckers since 2013, and now has 40 in service.

Conclusion? Opting for electric buses is not the only way of benefiting the environment. Gas has major advantages, and switching to it is not as difficult as you might think. //

