

Dual-fuel G-volution

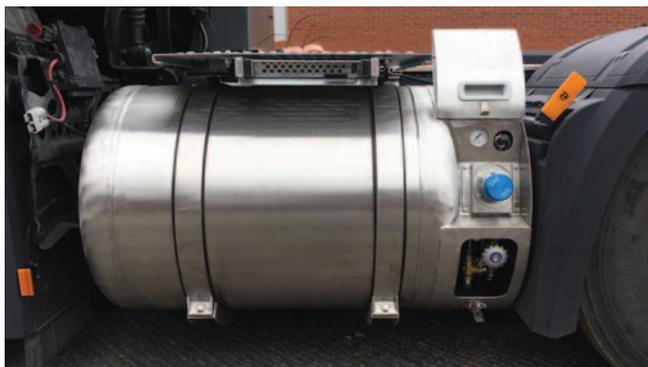
Managing director Chris Smith explains why G-volution PLC is a world leader in multi-fuel technology

Diesel engines are efficient, and they are everywhere. They need to become cleaner, greener and cheaper within the current infrastructure. G-volution is a proven clean technology business set to transform the transport industry. G-volution PLC has developed the Optimiser™ System, a dual-fuel technology that enables trucks to combust diesel and natural gas (or other greener and cheaper fuels, bio-LPG, or hydrogen) simultaneously, which saves 20%+ on fuel costs and reduces some emissions by up to 90%.

For six years the Optimiser System has been tested and driven over 30 million kilometres by keen customers who have all returned for further orders. G-volution is operating in Europe, Asia and North America, and working in partnership with original equipment manufacturers (OEMs) and Tier 1 suppliers. The diesel engine is being phased out, and there is strong EU pressure to reduce emissions and to decarbonise transport – this will revolutionise the heavy goods vehicle (HGV) industry.

Dual-fuel is predicted to play a major part in this revolution. Volvo, a leading truck maker, chose dual-fuel as the most promising technology. Lars Mårtensson, Volvo Trucks' environmental director, commented: "This unique technology allows us to combine the advantages of gas with the diesel engine's high efficiency rating, which is about 30-40% superior to that of the spark ignition engine. As a result, this truck consumes considerably less energy than traditional gas trucks." Additionally, dual-fuel has lower capital and maintenance costs than gas-only engines, it does not rely solely on gas infrastructure, and it can be retrofitted to existing diesel trucks. Dual-fuel is predicted by most industry observers to become a substantial industry.

The transport or HGV industry is notoriously conservative, but manufacturers are increasingly realising that they must adopt dual-fuel. Alcimed, an experienced industry analyst, predicts that the overwhelming benefits and competitive momentum will



Industry awards:



Low Carbon Innovation



Low Carbon Transport



Low Carbon Entrepreneur

Technology innovation and development grants:

- 1) 2009 – Carbon Trust – dual-fuel diesel engine;
- 2) 2010 – Technology Strategy Board – exhaust gas reprocessing;
- 3) 2013 – Technology Strategy Board – low carbon truck demonstration trial (1);
- 4) 2013 – Technology Strategy Board – low carbon truck demonstration trial (2);
- 5) 2014 – EU Horizon 2020 FDP7- Cloud SME-based engine modelling;
- 6) 2015 – RSSB (Rail Safety and Standards Board) – dual-fuel rail engine feasibility study;
- 7) 2015 – EU Horizon 2020 – EURO 6 HGV feasibility study; and
- 8) 2016 – INNOVATE UK IDP12 – EURO 6 emissions compliant HGV engines.

Technology Strategy Board
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compel customers in Europe alone to buy 100,000 dual-fuel HGVs by 2020. That represents a £2.5bn (~€3.2bn) industry.

G-volution technology has been developed and patented as an emulation technology that many industry experts believe is the best and most cost-effective dual-fuel solution. Unlike its competitors, G-volution owns all the IP to manage the mix of two or more fuels by emulating the diesel injector signal. This unique technology allows the dual-fuel engine to operate exactly as if it were running on 100% diesel and eliminates the risk of failure



from overpowering or over-torquing, unlike some other competing technologies. In addition, the technology preserves the drivetrain and original onboard diagnostics (OBD) exactly as it would be under conventional diesel power. The Optimiser System will deliver Euro 6 performance and zero ‘methane slip’ (i.e. engine combustion inefficiencies). Other opportunities for applications of G-volution’s technology include off-road and construction equipment, static engines such as generators and large powertrains for ships and railway locomotives.

G-volution has worked with some major Tier 1 and OEM technology around the world. G-volution has developed its own unique technology in the following engines and sectors and fuels:

- MAN D20 in LPG and LNG in the UK with Containerships (UK) Ltd and other leading customers. Euro 6 models have been available since June 2016 and will be fully Euro 6 compliant for emissions in 2017;
- Mercedes Axor in LNG and LPG also. Euro 6 models have been available since June 2016 and will be fully Euro 6 compliant for emissions in 2017;
- Cummins QSK 19 for off-road use in rail, marine and power generation (USA);
- CAT C.18 for off-road use in rail, marine and power generation;
- DAF Euro 5 has been tested in the UK; and
- Isuzu and Hyundai duel fuel engines are in development.

G-volution has also developed technology to deal with engine combustion inefficiencies and exhaust treatment. These include collaboration with leading OEMs and Tier 1 suppliers to achieve

Euro 6 compliance on the road. Significant work is also being done related to hydrogen dual-fuelling and exhaust gas reformation.

G-volution has a unique, proven system of engine development using computer-based modelling in the UK. This allows a significant reduction in development time and cost as well as a more efficient system at the end of the development.

Overall, G-volution has proven a unique, patented dual-fuel system which has been shown to be the most cost-effective, compliant dual-fuel system in the world. A large amount of research and development continues as G-volution develops its system for more engines, in more sectors, in more countries as demand for cost-effective, efficient and emissions compliant systems grows in every sector, in all geographies. It is widely acknowledged that dual-fuel remains one of the few solutions to the requirement to de-carbonise heavy duty diesels by 2030.



G-VOLUTION™

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