

EMISSIONS BOX

An Irish inventor has developed a retrofit system that he claims reduces fuel consumption and emissions of NOx and CO, reports Will Dalrymple

The NuNRG Reformers system includes an electrolyser that breaks down deionised water into its constituent elements – hydrogen and oxygen – and injects them into the vehicle’s air intake. At standard operating temperature of 50°C, water vapour is about 25% of the mix by volume, although it is produced in some quantity even at cold startup.

The 24V sealed unit, which only operates when the engine is running, draws 9.5A DC from the alternator; an LCV version, rated at 12V, draws 9A. Both units consist of 12 stainless steel electrodes in a 1% potassium hydroxide (alkaline) electrolyte fed by a 1-litre water tank. The system costs £3,500 plus VAT to install, plus an ongoing maintenance cost of £500 per year, consisting of an operational check and possibly replacement of electrical connections, if they have been corroded by exposure to external moisture.

According to inventor David Harvey, formerly an architect, the gases produced lower the temperature of combustion, improving combustion efficiency and reducing production of particulate matter and emissions of CO and NOx. He adds that the system tends to clear carbon deposits out of an engine, which end up in watery exhaust; that is the reason, he says, that emission benefits can lag a month or two behind



installation. “Smoke and soot is virtually eliminated from a diesel engine,” he says.

Harvey says that a total of 42 units have been fitted, mainly to cars. It has been difficult to reach commercial vehicle operators for operational data. Ireland’s Roscannon County Council fitted the units to VW Caddy vans and Scania trucks, but has since removed them and had no comments to make about their efficacy. A Scottish bus operator said to have fitted the units did not reply to requests for comment.

One operator who did go on the record was Dublin-based vehicle

transporter operator NVD, which saw a fuel improvement after it fitted the system to a 434bhp 2014 Renault Premium a few years ago. According to Harvey, the vehicle’s fuel consumption decreased from 41.7 litres per 100km in January to 36.8L/100km in August 2018, although no other operational data from before or after this time was provided.

NVD transport manager Michael Morgan recalls that the company fitted the system to a spare used for short-run jobs by multiple drivers to create the most challenging operational environment possible. He recalls that the retrofit itself took only a few hours, and had no adverse operational consequences. Opinions among drivers differed about whether the system made the truck feel more torquey in driving.

Despite the positive experience, Morgan admits that he wouldn’t yet be willing to roll out the system across the fleet of 145 vehicles, out of uncertainty about whether it could deliver results in other operating conditions. However, he said that the system has proved itself sufficiently to justify further trials.

In the meantime, data in an upcoming trial at a state-owned Irish bus operator is to be analysed by independent tester Emissions Analytics UK. [TE](#)

NO NEED TO NOTIFY

Although Harvey has received DVSA’s blessing to fit the device on trucks and buses, in fact retrofitting emissions abatement devices such as his are no longer notifiable modifications, according to a 2016 DVSA letter which he shared. For trucks, they are out of scope of regulation 30 of the Goods Vehicles (Plating and Testing) Regulations 1988 as amended. And for public service vehicles, the DVSA official states that the Department for Transport has agreed that they do not need to be reported through the usual route, form VTP5 under s.20 (2) of the Public Passenger Vehicles Act 1981.