Source: / www.dougjack.co.uk/bus-industry-euro-6-emissions-limits.html

European Industry has Settled on Euro VI

The European Union introduced Euro VI emission limits on buses and coaches (and other vehicles) from the start of 2014.

There were initially limited short-term derogations for Euro V vehicles which had been in build by September 2013 and those tended to be applied to combinations of chassis and bodywork.

Some countries, notably the United Kingdom, were slow to incorporate Euro VI standards in their own domestic legislation so Euro V vehicles continued to be available until as late as 2018. Also, small series production vehicles could be homologated with Euro V engines.

As can be seen from the chart, Euro VI required a reduction in Particulate Matter to 0.01g/kWh, and reductions in Nitric oxides(NOx) to 0.4g/kWh. These were very strict limits and required substantial engine development by the manufacturers.

The major European manufacturers reckoned that they each spent at least one billion Euros on developing the latest generation of engines. Fortunately, for the bus and coach industry, many of those power units are shared with trucks which are built and sold in much higher volumes. As a result prices of vehicles rose by around 10-12,000 Euros, simply because of the greater complexity and, in most cases, much larger and more powerful cooling systems.

At the same time, some manufacturers decided to introduce completely new models, rather than shoe-horn Euro VI engines and their larger cooling systems into existing models. At the same time, they introduced various other new features, making it much more difficult to have a direct comparison between Euro V and Euro VI prices.

Most manufacturers achieved Euro VI limits by a combination of Selective Catalytic Reduction and Exhaust Gas Recirculation. Iveco and Fiat Power Train said that their modern Cursor range of engines could achieve the new limits solely by SCR, which gave them an advantage in weight and economy. Scania also offers selected engines for buses which only need SCR after-treatment.

The manufacturing industry feared that some customers would try to buy ahead while Euro V engines were still available, and that there could be a drop in production when Euro VI became mandatory. To some extent, that happened, but not to any serious level.

Daimler Buses predicted the potential threat and was quick off the mark with the introduction of Euro VI engines. The company held extensive comparative tests under practical working conditions with Euro V and Euro VI city buses in Wiesbaden in Germany, and similarly with Setra coaches on an intercity circuit.

They found savings of up to eight per cent in fuel consumption with the Euro VI models. Even if the average saving is only around five per cent, bearing in mind the price of diesel, that saving will soon compensate for the additional purchase price of a Euro VI bus or coach.

Other manufacturers soon found similar improvements in fuel consumption and that has also been the experience of operators. The cost of amortising a new bus or coach is around 9-10 per cent of the total operating cost per mile. Therefore, the increase in price for Euro VI was only marginal. In Western Europe, the labour costs of drivers, maintenance and other staff continue to represent around 60% of the running costs per km of a typical bus or coach.

Source: / www.dougjack.co.uk/euro-6-european-emission-standards.html

Operators have found that savings in fuel consumption are real and that even further savings can be achieved using telematic systems that are positioned within the driver's vision. A series of lights advise the driver to be as economical with fuel as possible. Green lights indicate good performance. Yellow indicate that there could be an improvement, while red lights will indicate harsh acceleration or braking. These systems can be monitored by bus depots so that the best drivers are awarded bonuses and those who are less efficient can be trained and brought up to higher standards.

While there has not been any suggestion of Euro VII, there will be further tweaking of Euro VI with features like on-board diagnostics (OBD) as standard, constantly measuring emissions. Legislators will concentrate on maximising fuel economy. Manufacturers have identified various measures which can be taken and, when put together, can achieve significant further savings.

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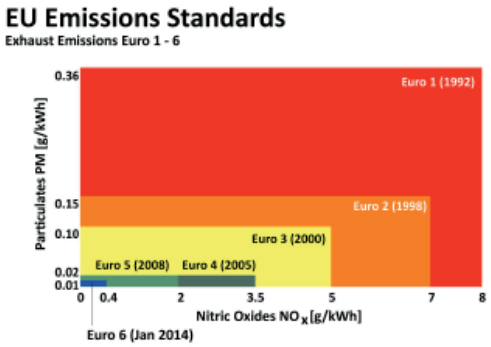

Euro VI Emissions Standards

VDL Futura FHD2 Engine Compartment

Volvo 9900 at Busworld 2019

Irizar i4 at Busworld 2019

Source: / www.dougjack.co.uk/euro-6-european-emission-standards.html

Cummins Enviro 200 Shape at Busworld 2019

Euro VI Emissions Scania