



PETROL VERSUS DIESEL

What is the right fuel policy?

The petrol vs. diesel debate has evolved, and is now influenced by several revolutionary industry developments. New European emissions standards, plug-in technologies and hybrid vehicles are redefining the fuel landscape and changing the way fleets think about fuel policy.

These developments are positive and exciting – but they make fleet policy decisions more complicated.

Although excellent, these new developments make policy design and fuel type decisions more complicated. Success depends on using the right fuel for the right application, cost-effectively. We recommend that fleet policies should be technology-neutral – to include all fuel types and combinations – and that Whole Life Cost methodology can be used to identify the right vehicles for your fleet needs.

Consider the type of driving you'll be doing (urban, motorway or rural), with a focus on the number of miles travelled per day. Securing the right policy now will pay dividends later – especially as more plug-in vehicles come to market and environmental reporting schemes play a more central role in business.

BACKGROUND

Historically petrol was always the fuel of choice for cars and fleet. It provided high levels of power and performance as well as refinement and quiet running. Diesel was fundamentally a fuel for trucks and haulage and was not commonly seen in the UK in cars or on car fleets.

In the late 1990s the arrival of common rail and direct injection diesels changed the dynamic of the diesel engine for cars. It provided excellent fuel economy, but then coupled with a turbocharger could also provide high power, reduced noise and greater refinement. The final boost to diesel technology in fleet was the introduction of the CO₂ based company car tax in 2002. Diesel cars were far more fuel efficient than their petrol counterparts, producing much lower CO₂ emissions and this resulted in lower company car tax as well as lower fuel costs. Even with HMRC's 3% supplement for diesel fuel on the Benefit in Kind company car tax system the diesels provided significant tax savings, and the rise of the diesel company car was assured. By tax year 2011/12, according to HMRC, 78% of all company cars were diesel and many companies had mandated a "diesel only" company car policy.

Diesel's great fuel efficiency, and hence low CO₂ emissions, was all very positive but diesels also produced higher levels of NO_x, SO_x (nitrous oxides and sulphur oxides) and particulate matter. The Euro Emissions Standards were introduced in 1992 to target toxic tailpipe emissions from all vehicles sold in the Euro Zone, and these provided maximum levels of permissible emissions.

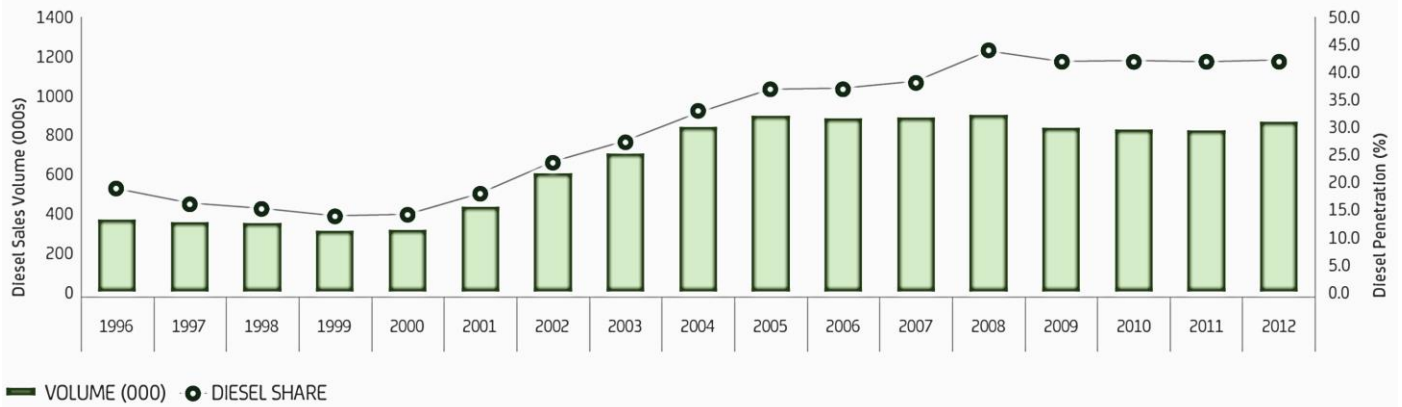
This created two parallel systems in the UK, the CO₂ based taxation systems (BIK and VED) were used to reduce greenhouse gas emissions and increase fuel economy, and the Euro Standards legislation to reduce harmful tailpipe emissions.

The Facts About Petrol Versus Diesel

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UK - Diesel Car Sales



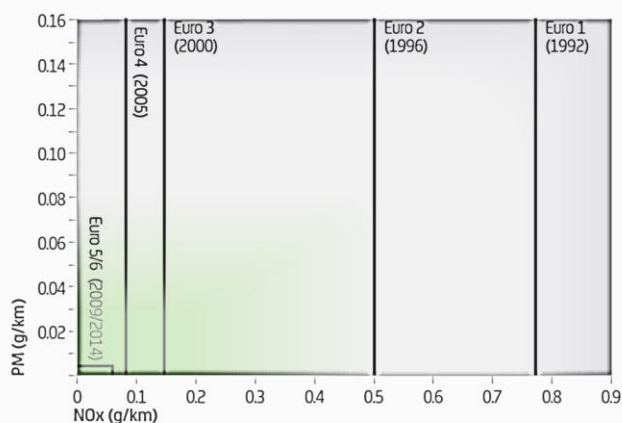
The current Euro 5 emissions requirements has dramatically reduced particulate matter from diesels using devices such as particulate traps. Sulphur has been all but removed from diesel fuel at the refineries, and now nitrous oxides are being reduced to very low levels with latest technologies that meet Euro 6 compliance which include Selective Catalytic Reduction and urea injection systems. This has made the very latest diesels much cleaner, however there are still concerns over the effect of diesel emissions in cities and densely populated areas, although mainly from older technology diesels. The ultra-fine

particulates from diesels are known to cause respiratory issues and vehicles cause the majority of local air pollution in cities such as London.

So the issue is that diesel is fundamentally good for minimising greenhouse gas emissions and maximising fuel reserves compared to petrol, but traditionally its local tailpipe emissions have been far worse than an equivalent petrol car. The new Euro 6 emissions standards though have brought diesel emissions to very low levels and extremely close to those of petrol powered alternatives.

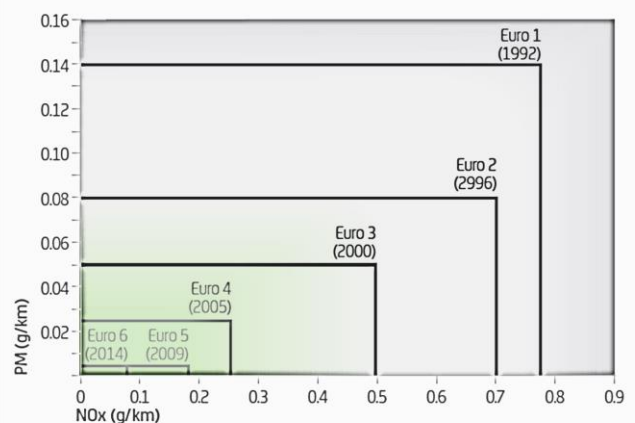
EURO EMISSIONS – PETROL

NOx and PM emission standards for petrol cars



EURO EMISSIONS – DIESEL

NOx and PM emission standards for diesel cars



CURRENT COMPANY CAR FUEL POLICIES

Company car policies must be living documents that always reflect the needs of the business and the wider UK fleet market, and that includes taxation, financial implications, technology and vehicle availability.

Over the last 10 years, some companies have opted for a diesel only policy on the grounds of cost and tax savings. The strong fuel economy of diesels and the low CO₂ emissions has made this an easy decision for some fleet operators to make.

Some fleets have made this decision based on additional operational requirements. For example Fire and Rescue Services have a diesel only policy for cars for operational resilience, as they bunker diesel for the heavy fleet and can use this for all vehicles in times of fuel shortages. Haulage companies often also have a diesel only car policy so they can benefit financially from their bunkered diesel for the HGVs.

Some fleets will have an open policy and let employees have free choice over petrol or diesel cars, some with CO₂ or MPG restrictions to ensure only efficient vehicles attain a place on the fleet.

NEW FUELS, NEW TECHNOLOGIES, NEW APPROACH

When the last ‘petrol versus diesel’ debate raged in the 1990s/2000s there were fundamentally only the two fuel choices, with the exception of LPG which had a brief outing in that time. And within this debate, diesel really stole all the prizes due to its clear CO₂ and mpg benefits, but now the argument is not that clear cut. There are many different diesel and petrol technologies with varying levels of efficiency with hybridisation and petrol engine downsizing, such as the Ford EcoBoost petrol unit. In addition many of the previous assumptions need to be cast aside, such as automatic gearboxes are less efficient than manuals and a small engine cannot be powerful.

Also ‘plug-in’ technologies are coming onto the market which have the ability to reduce tailpipe emissions and CO₂ to zero. Using purely electricity or a combination of electricity and petrol or diesel internal combustion engine, the key benefit of these technologies is to remove tailpipe emissions completely when driving in urban environments.

The high levels of vehicle technology and fuel choice is excellent, but does make policy design and fuel type decisions more complex. The next section will help you decide the best options for your fleet operation.

WHOLE LIFE COST

One of the most effective fleet policies for fuel choice is utilising Whole Life Cost (WLC). This vehicle choice methodology allows you to consider any vehicle fuel/technology on its cost merits, including acquisition cost, disposal, maintenance, Class 1 NI, and fuel cost. Hence no fuel/ technology will be ruled out in principle and strong cost control can be exercised.

It will also allow fair comparison of electric vehicles against traditionally fuelled vehicles as often they will have a price premium for the battery technology, but the maintenance and fuel costs will be significantly less than traditionally fuelled vehicles. This will show the true running costs and the only consideration then will be the suitability of the electric vehicle for the type of driving and the ranges required by the driver.



VEHICLE FUEL TYPES AND TECHNOLOGIES

Now, in 2015, there are numerous vehicle fuel types and technologies which all have strengths and weaknesses. The following guides you through the main principles and where the vehicles are most suited for driving.

- Diesel – best suited to A roads and motorways where a) it is at its most efficient b) particulates and NO_x have minimal effect on health, as opposed to in urban environments where the negative health effects can be significant (especially in pre Euro 5 vehicles). In addition many diesels struggle with short urban journeys as the diesel particulate filters do not get the chance to regenerate

- Petrol – now that new more efficient engines are closing the efficiency gap on diesel slightly, many of the new “small” capacity engines are great in urban environments. However, not all are efficient on A roads and motorways at sustained higher speeds, so careful consideration is needed as to their suitability for sustained motorway driving
- Hybrids – bridging the efficiency gap between pure diesels and petrol engines, hybrids are best suited to urban stop start driving, but are still efficient in mixed driving conditions, and provide reduced emissions and improved fuel economy in urban driving conditions. This is due to a battery and electric motor that utilises regenerative braking to charge the batteries, which can then provide added power when necessary allowing a reduced size/lower power engine to be utilised. Examples – Toyota Prius and Lexus
- Plug-in Hybrids (P-HEV) and Extended-Range Electric Vehicles (E-REV) – these have the ability to be plugged into an external electric supply to maximise the low cost and emissions of electric vehicles without the range anxiety. P-HEVs are essentially hybrids with larger batteries and the ability to plug into the mains to allow 10 – 30 miles of pure electric driving to be carried out. E-REVs are similar in that they use both petrol and electricity, but they are essentially a pure electric vehicle with an on-board generator to recharge the battery on the go if you run out of electricity. These vehicles are still ideally suited for urban driving due to their zero emission potential, but have the ability to do longer journeys regularly. The more travelling that can be done on pure electric, the better the cost and emissions. Examples – Mitsubishi Outlander P-HEV, Plug-in Prius, Volvo V60 P-HEV and BMW i3 Range Extender
- Pure Electric – These vehicles run purely on electricity. Many of these are best suited to urban drive cycles with occasional longer trips due to their limited range between charges (typically circa 75 - 100 miles). Some high performance electric vehicles are capable of continued A road and motorway use such as the Tesla Model S, due to its maximum range of 300 miles. Range however is a key consideration when looking at pure EVs, but cost savings and zero tailpipe emissions provide strong benefits. Examples – Nissan Leaf, BMW i3, Renault Zoe, Tesla Model S



DIESEL VERSUS PETROL POLICIES

We believe that with such a dynamic and changing marketplace the best advice regarding a fleet fuel policy is simply using the right fuel for the right application, and WLC to identify the most cost effective individual vehicles. If the policy is set up correctly you can use this to ensure some efficient petrol's are included where urban and extra urban driving is common, and retaining diesel vehicles where high mileage motorway driving is required. For scenarios where lower mileage, urban centred journeys are required, pure electric or P-HEV/E-REVs may be suitable, but to limit the fleet to any one fuel type would not be seen as wise during this period of significant change in the UK fleet market.

Most fleets who have had a diesel only policy in place are moving away from this restriction and we would expect this trend to continue due to the increase in plug-in vehicles becoming available in the market, and the advances in petrol and hybrid vehicles.

Diesel will maintain its place on fleets for the foreseeable future with more advances in diesel technology reducing emissions and increasing fuel efficiency. The Euro Emission Standards legislate ultra-low tailpipe emissions and hence the negative health effects of diesel is a primary concern with older technology vehicles.

Finally with diesel we must not forget that the diesel 'compression ignition' internal combustion engine is still the most efficient technology and diesel as a fuel has the highest energy density so ultimately has greater potential efficiency than petrol or gaseous fuels.