

Green Fleet Management

energy
saving
trust

managing your vehicles more efficiently

Department for
Transport

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Introduction

Green fleet management can help your business to reduce its costs and minimise its environmental impact. This guide to green fleet management is aimed at organisations running small or medium sized fleets of sub 3.5 tonne vehicles but the principles apply to fleets of all sizes.

For further information and advice:

- ✔ Sign up for our free monthly Fleet Briefing, rounding up the latest news from the fleet industry, with a focus on cost and carbon savings. Email transportadvice@est.org.uk to subscribe.
- ✔ Read our best practice guides covering topics such as grey fleet management, fuel cards and telematics systems. Copies can be downloaded from our website.
- ✔ View our series of webinars on subjects including plug-in vehicles, salary sacrifice schemes and eco-driving.
- ✔ Speak to one of our transport advisors on 0845 602 1425 for in-depth tailored advice.

Green fleet management

Green fleet management involves managing vehicles with a view to minimising their fuel use, emissions and costs. The most significant emissions are:

- ✔ Carbon dioxide (CO₂).
- ✔ Nitrogen dioxide (NO₂) or nitrogen oxides (NO_x).
- ✔ Particulate matter (PM).

Most organisations are primarily focused on reducing carbon emissions because of the link with taxation. Others view them in the context of environmental policy, particularly in relation to climate change. Poor local air quality, caused by NO_x and PM emissions, is a major issue, particularly in urban areas. These local air pollutants may be the primary concern for some organisations.

How can fuel use, emissions and costs be reduced?

- ✔ Selecting a lower emission (higher fuel economy) conventional petrol or diesel vehicle.
- ✔ Selecting a lower emission alternative-fuelled vehicle, for example a plug-in or biodiesel model.
- ✔ Maximising the fuel economy performance of the vehicles on the fleet.
- ✔ Minimising mileage.

What vehicles should I review?

Any vehicle that is used for business purposes should be considered, such as:

- ✔ Company owned or leased cars.
- ✔ Company owned or leased vans up to 3.5t gross vehicle weight (GVW).
- ✔ Cash allowance cars – privately owned cars where the employee has taken a cash sum in lieu of a company car.
- ✔ Grey fleet cars – privately owned cars where staff receive a mileage rate (sometimes in addition to an annual lump sum) to use their own vehicles for business purposes.
- ✔ Heavy goods vehicles (HGVs) greater than 3.5t GVW.

Further help

This guide will help organisations identify the issues they need to address and signpost sources of assistance. Tailored advice will often be necessary and Energy Saving Trust (EST) has a range of services to help. The table below highlights some of the advice programmes available:

Advice programmes

Fleet size	EST advice programmes
20+ vehicles	Fleet Health Check – a top-line overview of your fleet’s performance, including a carbon footprint together with recommendations to reduce costs and carbon.
50+ vehicles	Motorvate – a certification scheme which supports, recognises and rewards organisations that are working hard to reduce carbon emissions.
All fleet sizes	Smarter Driving – a driver training programme to help your employees drive more efficiently. It could help to cut your fuel bills by up to £250 for each driver covering 12,000 miles a year.

Vehicle selection

Understanding the mpg, CO₂ and Euro standard of a vehicle is fundamental to informing vehicle choice.

Key messages:

- ✔ The lower the CO₂ emissions of a vehicle, the lower your costs will be in terms of:
 - ✔ reduced fuel costs.
 - ✔ reduced class 1A National Insurance contributions.
 - ✔ reduced vehicle excise duty.
 - ✔ reduced corporation tax.
 - ✔ employee benefit through reduced benefit-in-kind tax.
- ✔ CO₂ and mpg are linked: the higher the mpg (or fuel economy) the lower the CO₂ emissions.
- ✔ Compare whole-life costs when choosing vehicles; take all running costs including fuel and taxation into account.

Information sources for vehicle CO₂, mpg and Euro standard

The environmental performance of a vehicle is largely determined by three factors:

- ✔ **Fuel economy** – measured in miles per gallon (mpg).
- ✔ **CO₂ rating** – measured in grams of CO₂ produced per kilometre travelled (g/km).
- ✔ **Euro standard** – this determines the quantities of PM and NO_x the vehicle emits. The higher the standard the lower the emissions, e.g. a Euro V car has lower NO_x and PM emissions than a Euro IV car.

Finding out the mpg, CO₂ and Euro standard of a vehicle is fundamental to informing vehicle choice. The following are useful sources of information:

For cars

- The [Directgov website](#) lets users find the fuel consumption and CO₂ emissions of a particular make of car, or to see the cost of vehicle tax.
- [Businesslink](#) is for UK business and commercial users, or those looking for more detailed information about the testing process.
- [Comcar](#) allows users to search for cars within various parameters including cost, body type etc, and also has tools for company car drivers to determine the tax to be paid on different models.
- Download EST's '[Company Cars: A Guide for Drivers](#)¹ publication for more information on the financial implications of vehicle selection.
- View our [April 2012 webinar](#) covering the key changes announced in the Chancellor's Budget, including worked examples of the costs associated with different vehicles.

For vans

- [VCA](#) allows users to find out the mpg, CO₂ and Euro standard of any new van available in the UK.
- [Van chooser](#) provides help for van buyers and operators when choosing a new van.

Whole life costs

When deciding on which vehicle to purchase or lease, organisations should base their decisions on whole-life cost analysis. The key principle is that comparing vehicles on the basis of the total cost of ownership and operation, may produce a different answer than a comparison based on purchase or lease prices alone.

Key data for calculating whole-life costs, can be found on the following websites:

- [Fleet News car running cost tables.](#)
- [Fleet News van running cost tables.](#)
- [VCA van fuel consumption data.](#)

Finding out the mpg, CO₂ and Euro standard of a vehicle is fundamental to informing vehicle choice.

¹ Please note that this guide was produced in the 2011-12 tax year. Some of the figures and examples used are out of date following the March 2012 Budget. The general principles and formulas for calculations are still applicable.

Vehicle taxation

Lower CO₂ vehicles result in lower tax, particularly for cars. The table below shows the taxes and allowances that are linked to car CO₂ emissions:

London Congestion Charge

Whilst this is not strictly a tax, the London congestion charge acts as a fiscal incentive for reducing CO₂ emissions. The Greener Vehicle Discount (GVD) provides a 100% discount from the congestion charge for cars that emit 100g/km or less and that meet the Euro V standard for air quality.

Taxes and allowances that are linked to car CO₂ emissions

Tax	Summary
Company Car Tax (CCT)	CCT is based on a percentage of a vehicle's list price, determined by the car's official CO ₂ emissions. The list price for this calculation is the published on-the-road price minus the first registration fee and VED. The VAT inclusive price of any factory or dealer-fitted extras are added (excluding certain high-end security features such as bulletproof glass).
Car Fuel Benefit (CFB) (Free private fuel benefit in kind tax)	CFB is based on a percentage of the fuel benefit charge (currently £20,200), determined by the vehicle's CO ₂ emissions.
Vehicle Excise Duty (road tax)	13 CO ₂ emissions bands with tax ranging from £0 to £475. First year rate ranging from £0 to £1,030 (2012-13).
Class 1A National Insurance contributions on company car and free fuel benefit	Class 1A NI contributions are currently charged at 13.8%.
Capital allowances on vehicle purchase and lease costs.	<ul style="list-style-type: none"> - 100% 1st year capital allowances are available on all cars with emissions of 110g/km or less and all plug-in cars and vans. - Operators of cars with emissions greater than 160 g/km can only write down at 8% per annum compared to 18% for cars between 111 and 160g/km. - Leased cars with emissions greater than 160 g/km can only offset 85% of the lease rental compared to 100% for cars of 160g/km or less. - These thresholds will be subject to further reductions from April 2013 – read our budget summary document for more information.

Alternatives to petrol and diesel

The new generation of plug-in cars have a typical range of 80 to 100 miles.

Key message:

The alternatives to conventional petrol and diesel fuelled vehicles have advantages and disadvantages. Environmental, economic, technical and operational factors need to be assessed on a case by case basis.

Hybrid

Hybrid cars use both electric motors and a traditional engine to drive the vehicle. Initially, hybrids used petrol engines, but diesel hybrids are now available in the UK as well.

The **potential advantages** are that they run on petrol or diesel and emit less CO₂, NOx and PM. Many small and medium sized hybrid cars fall within the current Greener Vehicle Discount criteria and they typically have a very good environmental performance in urban, stop-start driving conditions.

The **potential disadvantages** are that the vehicles have a price premium and there are a limited number of models currently available. They may not be the best choice for predominantly motorway use.

Plug-in vehicles

Pure-electric vehicle (Pure-EV)

Pure-EVs are powered in full by a battery that can be plugged directly into the mains. The new generation of plug-in cars have a typical range of 80 to 100 miles on a full charge, which is adequate for the commuting and daily driving patterns of many people. Pure-EVs will have passed the stringent safety testing demanded for conventional vehicles and in terms of overall performance, they will be suitable for normal use including journeys outside of urban areas. Efficient diesel vehicles are likely to be better for long distance motorway driving.

For more information, [read about plug-in vehicles on EST's website](#) or [view our recorded webinar](#).

Plug-In hybrid vehicle (PHV)

PHVs are vehicles with a plug-in battery and an internal combustion engine. Typically they have a pure-electric range between 10 and 30 miles, after which the vehicle reverts to petrol or diesel hybrid mode.

Extended-range electric vehicle (E-REV)

Extended-range electric vehicles are driven from a battery, with an internal combustion engine powered generator on board. E-REVs have a shorter battery range than pure EVs, typically 40 miles.

Range is extended by the on-board generator providing additional miles of mobility.

The **potential advantages** include no tailpipe emissions at point of use (in electric drive mode for PHV and E-REVs), low fuel costs, and a full discount for the London congestion charge. They are currently exempt from vehicle excise duty and exempt from company car tax and van benefit tax until March 2015. They also benefit from a 100% first year writing down allowance.

The **potential disadvantages** are high purchase price, and limited range. Vans may have a reduced payload compared with a conventional vehicle with the same gross vehicle weight.

Plug-in vehicle grants

Grants of 25% of the purchase price, up to a maximum of £5,000, were introduced in January 2011 for qualifying plug-in cars. For qualifying vans, the grant is 20% of the purchase price, up to a limit of £8,000. For more details visit our [website](#).

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LPG (liquefied petroleum gas)

LPG is a blend of propane and butane, produced either as a by-product of oil refining, or from natural gas (methane) fields. As an alternative fuel, LPG is most suitable for use in cars and light vans. **Potential benefits** include significantly lower NO_x and PM emissions compared to diesel and lower CO₂ emissions compared to petrol vehicles. LPG fuel is currently about half the cost of petrol and diesel but fuel efficiency is less than that of conventional fuels, so typically overall costs per mile are around 25% lower than petrol and about the same as diesel. The **potential disadvantages** are that there are few vehicles produced by manufacturers, marginally higher CO₂ emissions than diesel and the LPG tank can reduce load space and payload. A **refuelling infrastructure** is in place but the fuel is less available than petrol or diesel. The upfront cost of conversion may be prohibitive, and it can reduce residual values.

Biofuels

Biofuel is a broad term encompassing a range of fuels made from organic, carbon-based material such as wood chippings, other plant material or waste oil. Three examples relevant to transport are biodiesel, bioethanol and biogas, and the potential advantages and disadvantages of each are summarised below:

Biodiesel is a renewable fuel that is produced from the oil of crops including oilseed rape, sunflowers and soya beans, as well as from waste cooking oils. It is included in standard pump fuel at a relatively weak blend of up to 7% biodiesel and 93% ultra-low sulphur diesel. Blends of up to 7% can be used in all diesel engines without modification. Biodiesel in concentrations above 7% is available from selected outlets. For more details visit [Biodiesel Filling Stations](#). Some manufacturers will allow concentrations higher than 7% to be used; however additional servicing may be required. Biodiesel can provide significant reductions in CO₂ from 'well to wheel', although this can vary considerably depending on the source and supplier of the fuel. Further details are available from the [Department for Transport](#). Additionally, oxides of nitrogen, a smog-forming gas, are slightly higher in biodiesel than with ultra-low sulphur diesel.

Bioethanol is another example of a liquid biofuel. It is made from starch plants (like corn, wheat and cassava), sugar plants (beet and cane), and sometimes cellulose plants (trees). It is included in standard pump fuel in a relatively weak blend of up to 5% ethanol and 95% unleaded petrol. A limited number of vehicles in the UK are modified to use an 85% concentration of ethanol (E85). This fuel is sold through very few outlets and would not be a practical proposition for most users. However, modified vehicles will run on normal pump petrol. The **potential benefit** of bioethanol is that there can be significant reductions in CO₂ emissions compared to fossil fuels, though once again this can vary depending on the source and supplier of the fuel. Further details are available from the Department for Transport.

Biogas, or Liquid Biomethane (LBM), is a renewable alternative fuel produced by breaking down organic matter by microbiological activity. Methane, the main component of biogas, is processed to the same specification as natural gas and is either fed into the piped network or is stored as compressed natural gas (CNG) for road vehicles. The **potential advantages** are substantial CO₂ benefits, depending on the waste products used to produce the fuel but likely to be at least a 60% saving; also NO_x and PM emissions are very low compared to diesel and petrol. Some vans which are able to use biogas are available from mainstream manufacturers.

Disadvantages include a lack of a public refuelling infrastructure and the high upfront cost of buying or converting suitable vehicles. Finally, CNG tanks require a significant amount of space, and are heavy (hence normally larger vehicles are adapted).

Potential advantages of biogas include low NO_x and PM emissions compared to diesel and petrol.

Hydrogen

Hydrogen is not yet a practical fuel for use in fleet vehicles, however, research, development and vehicle trials continue and this may change in the future.

Fuel management

Monitoring fuel use is essential in order to identify poorly performing vehicles and drivers.

Key messages:

- Badly driven and poorly maintained vehicles have higher emissions and fuel costs.
- Monitoring fuel use is essential in order to identify poorly performing vehicles and drivers.
- A vehicle limited to 60 mph will use approximately 15% less fuel than if travelling at 70 mph. The reduction in fuel consumption between 80 and 70 mph can be as much as 25%.

For small fleets, a manual system such as a simple spreadsheet is often the best way to monitor fuel use and mileage.

Fuel monitoring

Fuel contributes 25-30% to a vehicle's whole-life costs and is rising. It's not a fixed overhead that has to be accepted, it is a controllable cost that varies according to vehicle type, driving style, vehicle maintenance and mileage.

An accurate system for monitoring the fuel economy (mpg) of individual vehicles and drivers is key to maximising the performance of vehicles and minimising their fuel consumption.

The two determinants of fuel economy must be captured on a regular basis; the distance covered by each vehicle and the volume of fuel used. Armed with this data, it's possible to compare the performance of vehicles and drivers, and identify opportunities for efficiency improvements.

For small fleets, a manual system such as a simple spreadsheet is often the best way to monitor fuel use and mileage. Using fuel cards can help as most suppliers will provide fuel economy reports as part of their service.

In the absence of any training, the fuel consumption achieved by drivers is, on average, approximately 15% higher than the vehicle manufacturer's official combined mpg figure. This is derived from research undertaken by EST and Arval in 2006 and is based on the fuel card records of a large population of business drivers.

Driver performance

Other than the type of vehicle in use, the driver is the single biggest factor that affects fuel costs and emissions.

To encourage drivers, information on efficient driving should be included in driver handbooks, team briefings and internal newsletters. Further guidance can be found in EST's [Fleet Manager's Guide to Eco-driving](#).

Driver training is a very effective way of changing driver behaviour. EST's Smarter Driving training reduces fuel consumption by around 15%. More information can be found on our [website](#).

Speed limiters are another great way of modifying driver behaviour. They are increasingly used in vans to limit their speeds to 70, 65 or 60 mph, for example. Significant fuel savings are possible, depending upon how much the vehicle is used on roads with 70 mph speed limits. A vehicle travelling at 60 mph will use approximately 15% less fuel than it will travelling at 70 mph. The reduction in fuel between 80 and 70 mph can be as much as 25%. For more information, please download this [case study](#) of a company which fitted vehicle speed limiters.

Maintenance

Badly maintained vehicles will use more fuel than vehicles in good condition. Deterioration of performance between regular servicing can be identified by monitoring fuel economy, allowing any corrective action to be taken before the next planned service.

Maintaining correct tyre pressures is important to maximise fuel economy, tyre life and grip. Tyres under inflated by 20% will increase fuel consumption by about 2-3%.

Further information

For more detailed guidance on fuel management, please refer to EST's [Fuel Card Guide](#) and [Telematics Guide](#), available online.

Mileage management

Accurate route planning using SatNav systems can avoid traffic jams and find the most efficient route.

Key messages:

- Monitoring and managing mileage can deliver significant cost and emissions savings without impacting on business performance.
- Over-generous mileage rates incentivise unnecessary mileage.
- Free fuel for private use encourages unnecessary mileage and in many cases is not cost-effective for the driver.
- Consider alternative travel options to driving, such as public transport or using technology to avoid making the journey.
- Effective route planning can reduce mileage.

Mileage monitoring

Vehicle mileage should be monitored to identify under-utilised vehicles or high mileage drivers, and to question whether there are more cost-effective and efficient methods of conducting core business activity. The first step is to audit your organisation's travel patterns, using data from fuel card reports, mileage claims and other relevant sources to establish a baseline from which to work.

Mileage rates

Over-generous mileage rates act as an incentive to drive extra miles. They may also reduce the motivation for efficient driving and the choice of more fuel-efficient vehicles. HMRC set advisory fuel rates, updated quarterly, with recommended reimbursement values for different engine sizes and fuel types. The latest rates can be found on the [HMRC website](#).

Vehicle mileage should be monitored to identify under-utilised vehicles or high mileage drivers.

Fuel for private mileage

Any company paying for employees' private fuel is creating an incentive for them to drive excessively. Employees in receipt of free private fuel, pay tax based on a percentage of the fuel benefit charge (currently £20,200 for the 2012-13 tax year). The percentage is determined by the vehicle's CO₂ emissions.

For most staff, the true cost of free fuel is likely to exceed the value of the fuel consumed. Please read our [Guide for Drivers Choosing a Company Car²](#), for more information on the costs of 'free' private fuel.

Even where fuel cards are used, the driver can reimburse the company for private mileage, either at a fixed rate or at the actual average pence per mile, which can often be calculated by the fuel card company. This has the additional benefit of promoting economical driving at all times. Read our [Fuel Card Guide](#) for further details.

Travel alternatives

The amount of travel and its overall impact can be minimised by considering:

- ✔ Does there need to be a physical meeting? Will an audio, video or web conference suffice?
- ✔ Can a more sustainable mode of travel be used such as walking, cycling or public transport?
- ✔ Is there a low-emission pool or car club vehicle available?
- ✔ Can the journey be shared with a colleague?
- ✔ What is the best time for the meeting to minimise journey disruption?

Many organisations have developed policies on business travel as part of a wider workplace travel plan. See the Department for Transport's [Essential Guide to Travel Planning](#) for more information.

² Please note that this guide was produced in the 2011-12 tax year. Some of the figures and examples used are out of date following the March 2012 Budget. The general principles and formulas for calculations are still applicable.

Route planning

Accurate route planning using SatNav systems can avoid traffic jams and find the most efficient route.

Routing and scheduling software packages can help determine the most efficient way of planning vehicle movements. Telematics systems offer a number of potential advantages including:

- ✔ Real-time routing and scheduling of vehicles.
- ✔ Elimination of unauthorised private vehicle use.
- ✔ Elimination of unnecessary detours being taken en-route to a job.
- ✔ Identification of vehicle inefficiencies due to speeding, harsh driving style and excessive idling.

Further information

For more detailed guidance on mileage management, please refer to EST's [Mileage Management Guide](#) and a webinar covering [Managing Mileage: Cutting Cost and Carbon](#).

Routing and scheduling software packages can help determine the most efficient way of planning vehicle movements.

Grey fleet

Grey fleet vehicles usually have higher emissions compared to lease, hire or pool cars.

Key messages:

- Grey fleet vehicles are potentially more costly, more environmentally damaging and more risky than a company-provided vehicle.
- Alternatives to grey fleet include pool, hire or car club vehicles.

Despite this, the use of grey fleet is still sometimes the most cost-effective option for certain journeys. An example might be an employee driving a short distance for a long meeting and then driving back, on a route not served by public transport. In this case, it would be more expensive to keep a spot hire or pool vehicle for the whole day for two short journeys.

Problems associated with the grey fleet

The term 'grey fleet' refers to employee-owned vehicles that are used for business purposes. The grey fleet poses financial, environmental and health and safety concerns, such as:

- Grey fleet vehicles usually have higher emissions compared to lease, hire or pool cars.
- The grey fleet poses a greater risk in terms of vehicles not being insured for business use, not being roadworthy due to poor maintenance standards and the consequent risk of employees driving illegally.
- Other forms of car provision such as lease, pool or hire may be more cost effective.
- Lump sum and mileage reimbursement rates may be significantly higher than the costs incurred by drivers, incentivising unnecessary travel.

Further information

For more detailed guidance on grey fleet, please refer to EST's [Grey Fleet Management](#) and [Reducing Grey Fleet Mileage](#) guides. EST also presented a [Webinar on the Grey Fleet](#) which you can view online.

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