

Your guide to  
**Eco-Driving**

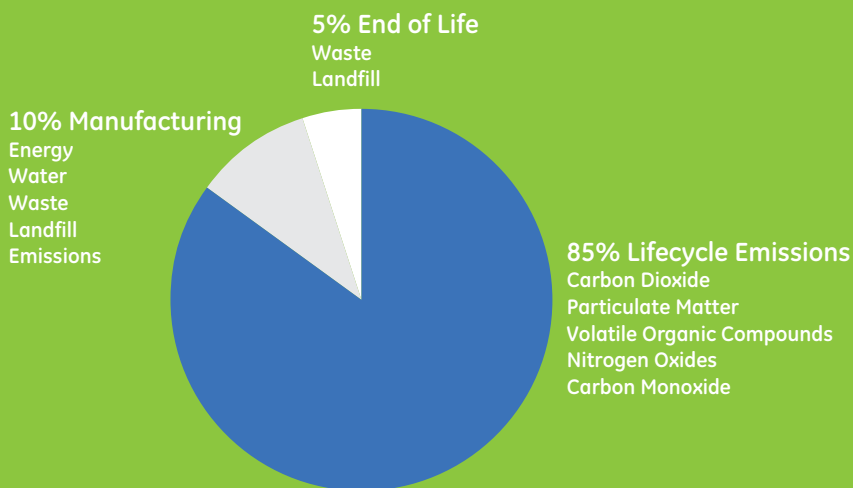
essential driver support 



GE imagination at work

# Small Changes can make a Big Difference

Did you know that throughout Europe around 25% of the total carbon footprint comes from transport? And that pollution related deaths from local air quality have increased to 32,000 per year?



It is alarming statistics such as these, which highlight the need to take action now and help reduce climate change. The reduction in vehicle emissions and fuel consumption is seen as a major contributory factor in minimising the effects of global warming.

In this guide to Eco-driving, you will find practical steps you can make today to reduce carbon emissions as well as an insight into alternative fuels and vehicle technology.

## Contents:

- What is Eco-Driving?
- Fuel-efficient driving
- Your vehicle
- Your driving style
- Vehicle and Fuel Choice
- How else can I help?

# What is Eco-Driving?

Eco-driving is about driving in a way that suits you, your car and the environment. It is driving to reduce fuel consumption, greenhouse gas emissions, accident rates and noise levels – therefore having a positive impact on both you as a driver and the environment.

## The benefits of Eco-driving

### Environmental

- Can reduce use and demand for non-renewable natural resources (fuel economy).
- Can reduce greenhouse gases.
- Helps improve overall air quality.
- Can reduce ambient noise levels.
- Reducing the need to change tyres and brake pads so often will also benefit the environment.

### Benefits to you

- Contributes to preserving the environment.
- Can reduce running costs, less fuel/ lower spend on vehicle maintenance and lower insurance costs.
- Can reduce stress.
- Can reduce vehicle wear and tear.
- Can increase safety.

## What can you do?

There are a number of ways in which you can help to reduce the amount of CO<sub>2</sub> being pumped into our atmosphere and at the same time save yourself time and money through decreased fuel consumption. It could be a small change such as making sure you fully tighten your fuel cap, to a big change, like car sharing with a friend to work. Whatever it is that you are able to change, it **will** make a difference.



Eco-driving  
can lead to fuel  
savings of **5-10%**

# Fuel-efficient driving

## means lower bills

Even if the effects on our environment aren't enough to make you drive economically, the cost savings will! There are many small changes you can make to the way you drive everyday, which will save you money and help save the environment.

### Refuelling

- **Where possible refuel at night**

Fuel generates fewer hydrocarbon vapours during the fuelling process when it is cool and dark, namely during the evening.

- **Make sure you fully tighten your fuel cap**

Up to 30 gallons of fuel can be lost annually due to evaporation when the fuel cap is not fully tightened. In addition to the unnecessary cost to the driver/ company, this pollutes the atmosphere with unburned hydrocarbons!

- **Try to find a competitive price in a forecourt**

Although it is easy to let your petrol light come on and dash to the nearest petrol station at the last minute, this is not an economical practice. Refuelling should be a planned process and one that involves searching for the most competitively priced fuel in your local area. Although it may seem insignificant, you would be surprised at the difference charged between some refuelling stations. For example, try using [www.petrolprices.com](http://www.petrolprices.com) to find the most competitively priced fuel near you. Motorway services are probably the worst place to stop and refuel as their prices far exceed that charged at supermarkets.

Also look out for certain fuel providers whose loyalty cards give you money back on fuel or even pay a certain amount to an environmental charity, small changes like this can make a big difference.

### Before setting off

- **Get plenty of rest before a journey**

A well-rested driver is much more alert and in better control over themselves and their vehicle. Ensuring you get enough rest means you are likely to be much calmer behind the wheel and less prone to instances of road rage, erratic driving and heavy breaking.

- **Plan your journey**

Try to plan your journey so you complete as many jobs in one trip as possible. Completing three jobs in one trip is much more economical than three separate trips.

- **Consider if the journey is necessary**

If you are only travelling a short distance, try walking or cycling. This will not only benefit the environment but also your health.

- **Avoid areas of serious congestion**

Check traffic and travel news before you set out, as it may be advisable to avoid a certain route. This will not only save you time but will also reduce the level of emissions expelled. Only travel in rush hour when absolutely necessary, if possible set off an hour early or later to avoid being stuck in long queues and adding to the congestion on our roads.

# Your Vehicle

## Did you know?

A recent survey of tyre pressure levels of 8,700 cars has shown that **44%** of cars worldwide had at least **1 tyre** at a low pressure level?

Vehicle preparation and maintenance are an essential part of eco-driving. Leaving roof racks attached, carrying excess weight and under-inflated tyres increases fuel consumption dramatically.

Follow our vehicle preparation and maintenance guide below and you will find that small changes can make a very big difference.

## Vehicle Preparation

- **Get rid of excess weight**

Clutter in your boot and back seat is extra weight that your engine must carry around. You can reduce the engine's workload and therefore save fuel by removing all excess weight from your vehicle. Remove things such as buggies, golf clubs, tools, footwear, paperwork etc. and this will also cut your CO<sub>2</sub> emissions dramatically.

- **Reduce aerodynamic drag**

Did you know that approximately 50% of the energy required to operate at motorway speeds is devoted to overcoming wind resistance? This becomes even greater when roof racks and similar items are attached to your car. Make sure that these are always removed when not in use as the resistance dramatically increases fuel consumption.

## Vehicle Maintenance

Having a well-maintained vehicle is key to reducing emissions. Regular maintenance and vehicle checks also have a highly positive effect on fuel use.

- **Tyre Pressure**

Ensure that all tyres (including the spare) are at the correct pressure, as every 6psi (pounds per square inch) a tyre is under-inflated the fuel consumption increases by 1%.

Under-inflated tyres create more resistance when the vehicle is moving, therefore your engine uses more fuel to deal with the increased pressure created. You should check tyre pressures regularly in accordance with manufacturer guidelines, especially when setting off on a long journey.

- **Keep your engine clean**

You should always follow and carry out the recommended maintenance checks as per the schedule laid out in your owner's guide. Where possible use energy-conserving motor oils, fuels with good detergent additives and maintain appropriate levels of oil, transmission fluid and coolant levels to ensure the engine is clean and running efficiently.



# Your driving style

Studies have shown that there is a significant correlation between driving behaviours, emissions and fuel economy. By following the rules of eco-driving you will not only drive in a way that benefits the environment and reduces vehicle operating costs, but is also safer for both yourself and other road users.

## Slow Down and Save Fuel

Speed limits are the maximum lawful speeds that may be driven in ideal circumstances, not the minimum you should expect to drive at.

Not only is driving above the speed limit uneconomical but it's also extremely dangerous. However, did you know that driving at 15mph or under creates the most pollution? Aim to keep speed between 20mph and 60mph but always abide to the speed limit set in that area.

The benefits of driving slower are particularly evident where large trucks and goods vehicles are concerned. With these types of vehicle, fuel mileage decreases by 2.2% for every 1mph increment over 55mph. However, driving at 15mph or under creates the most pollution. Aim to keep speed between 20mph and 60mph but always abide to the speed limit set in that area.

## Limit Idling

Not many people are aware of the fact that modern vehicle technology improvements have eliminated the need to warm up vehicle engines. You should not leave your vehicle idling as it produces excess emissions and wastes fuel. Where possible turn the ignition key off when operating away from public roads. Ideal situations where this can reduce fuel emissions are in a driveway, a car park or in a car wash.

Note: This should only ever be done where there is NO possibility of collision. Turning the ignition key off may disable certain vehicle features, including safety features such as airbags. It is recommended that you leave your vehicle running in city traffic or similar busy conditions.

### Did you know?

driving at **80mph** rather than **70mph** uses **10-15%** more fuel?



## Use the Air Conditioning/ Defroster Sparingly

Your air conditioning system can use up to 1 gallon of fuel per tank to cool the vehicle. In the summer, minimise the use of air conditioning by using the vent setting as much as possible. At slow speeds, turn off the air conditioning and open the windows to cool the interior. However, once you exceed 40mph, the drag caused by having your window down wastes more fuel than the air-conditioning.

In the winter, the defrosting system can place a significant load on the engine. In winter, use this selectively and try to alternate between the heater and defroster as necessary.

### Did you know?

it takes more energy to cool a hot vehicle than a medium sized home in Atlanta during the summer?

## Avoid stopping and starting

Every time you stop and start again in traffic, the engine uses more fuel and therefore produces more CO<sub>2</sub>. Keep your eye on traffic ahead and lights, slowing down early to give traffic a chance to get moving again by the time you reach it.

## Drive calmly

Keep an eye on your revs and change up before 2500rpm (petrol) and 2,000rpm (diesel). Revving up aggressively wastes fuel and increases emissions.

Harsh acceleration and braking can use up to 30% more fuel, causes increased wear and tear on the vehicle and is dangerous, particularly in urban areas.

## Gear Changes

Try to maintain a consistent throttle pressure, as this can minimise gear changes, which could help improve fuel economy. If you have a manual transmission, fuel economy typically improves when shifts occur at lower speeds. You should never rest your foot on the clutch or brake pedal as this could prove extremely dangerous.

### Did you know?

that how and when you change gear influences your fuel economy?



# Vehicle and fuel choice

It is essential that you choose the right car and fuel for you and your needs. You should look at a number of factors such as mileage, type of miles driven, tax rate, MPG and overall costs and assess what would be most practical/ economical for you. This is often a hard choice and you may not realise what options are open to you.

## Vehicle Choice

- **What do I want versus what do I need?**

What do you actually need a car for? Work? Family trips? Transporting goods?

Think if what you want is actually what you need. For example, do you really need a six-seater car for a family of four? Do you really need a 4x4 3L gas-guzzler for a journey of 20 miles a day? In general terms, smaller cars tend to be more fuel efficient and emit less CO<sub>2</sub>, so be realistic and try to strike a balance between what you want and what you need.

- **The engine**

Once you have decided on the type of car you would like, you should check out all the different makes, models and engine options. Vehicle manufacturers should be able to provide you with information around the vehicle ranges and their efficiency and environmental rating.

Seek advice about the environmental credentials of the vehicle you are looking at and what helpful additional extras are available with it.

## Diesel Particulate Filters

An example of this would be **DPF (Diesel Particulate Filter)**. This is a device used to reduce diesel particulate matter or soot from the exhaust gas of a diesel engine, (these are harmful emissions that are released when diesel fuel is burned), helping to reduce pollution.

DPF's usually remove around 85% of the soot but can at times reach efficiencies of 100%. A diesel-powered vehicle fitted with a particulate filter will emit no visible smoke and fumes from its exhaust.

Unlike a catalytic converter, a DPF filter cleans exhaust gas by forcing gas to flow through the filter. Many of these clever filters are designed to burn off the accumulated particulate themselves, this is known as 'filter regeneration', which means no extra work for the driver.





However, DPF filters are only suitable for certain drivers, as the car must reach a maximum of 50mph for up to 30 minutes to trigger the regeneration of the filter. These are therefore not suitable for inner-city drivers or those who regularly drive short journeys.

Before choosing a vehicle with a DPF system fitted, you should make an informed decision about which vehicle from a particular range is best for you, the driving environment it will be used in and what added extras are available. Do some research and both you and the environment will feel the benefits.

## Fuel choice

### Petrol versus diesel?

Did you know that by 2020, Europe will import 90% of its oil? And that proven oil reserves will only last around 40 years? This is why, now more than ever it is so important for us to find alternative, sustainable fuels.

Today there is no single fuel choice on the market in the bid to cut emissions and increase MPG. This therefore means that you must assess your personal needs and choose a fuel that is best for you and the environment.

As a very general rule of thumb, if most of the driving you do is long distance or motorway driving then you should perhaps consider a diesel engine as these are more economical over long distances. However, if you tend to drive in urban areas and on shorter distances then a petrol engine may be better suited to your needs.

# Alternative Fuels

## • Hybrids

By many, hybrids are being hailed as the answer to future environmental problems and companies are keen to get involved. However, at the present time there are only a few thousand of this type of vehicle on the road.

These vehicles use two or more distinct sources to power the vehicle. Examples include petrol-electric or diesel-electric. Features included on these vehicles are:

- the ability to recapture energy normally wasted during braking.
- a significant level of battery storage space and the ability to recapture and reuse energy.
- the ability to shut down the gasoline or diesel engine during traffic stops and while idling.

Due to these features, hybrid powered cars are particularly efficient for inner city driving, where frequent stops and idling are the norm. Hybrids also help to reduce noise emissions.

## • Bio fuels

Biofuels are traditional fossil fuels blended with a percentage of fuel from renewable sources.

An example of this is bio-diesel, which is made from fossil fuel diesel blended with fuel from some crops – this is typically about 5% by volume. The benefits of using crop-based fuels are that first and foremost, they're renewable; alongside this they also produce far fewer harmful emissions.

There are a number of other fuel alternatives that may also make a serious impact in the future, these are:

- **GTL** – Gas to liquid engines convert natural gas into liquid fuels. This is an attractive option as the fuel is clear, clean and virtually free of sulphur/ aromatics. Particulate emissions could be 26% lower, hydrocarbon 63% lower and carbon monoxide 91% lower compared to a similar diesel engine. (shell.com)
- **LPG** – Liquefied Petroleum Gas is a mixture of hydrocarbon gases used as a fuel. This has recently been used in diesel engines as it is non-toxic, non-corrosive and burns much more cleanly than petrol or diesel. However, as this has a lower density than these fuels, the equivalent fuel consumption is worse. On the bright side however, a lower governmental tax imposition makes this type of fuel much more cost effective.
- **Electric** – Electric cars produce no exhaust fumes and very minimal pollution, if the batteries are charged from most forms of renewable energy. Many of these vehicles can exceed speeds of conventional cars and produce virtually no noise pollution.

In 2008, Telsa Motors produced the DarkStar, a 2 seat convertible roadster, developed from a Lotus Elise. With 245 miles per battery charge and the capability of doing 0-60 in under 4 seconds, it goes to show that battery powered cars have come along way and are going to play a big part in our future on the road.

# How else can i help?

## Tax & legislation

New Government plans aim to reduce CO2 emissions in the UK by 25% by 2012. This is a colossal undertaking and one that is not being taken lightly by our Government. Tax changes and congestion charging are two means recently introduced by the Government, in the hope that our collective carbon footprint will be reduced. CO2 reduction and environmental concerns are here to stay, and as a result, the costs of running an environmentally unfriendly car will continuously rise. Tax and legislation should influence your choice of car, both now and in the future.

## Company Car Tax

Company car drivers pay tax on a percentage of the taxable value of their cars. This percentage is decided according to the cars emissions, so the lowest emission cars emitting less than 140g/km or less qualify for the lowest tax band, which is 15%. This then rises for every 5g/km to the highest polluters at 235g/km and above and these vehicles are charged 35% of the cars value. From April 2008, a new low company car tax band of 10% will be introduced for vehicles emitting less than 120g/km of CO2 or less. So the message here is pretty simple, the more economical your car, the less you'll pay in tax.



# Car Benefit In Kind Calculation

2008/09 g/km	% List Price for Tax	2009/10 g/km	% List Price for Tax	2010/11 g/km	% List Price
Up to 120	10%	Up to 120	10%	Up to 120	10%
121	15%	121	15%	121	15%
130	15%	130	15%	130	15%
135	15%	135	15%	135	16%
140	16%	140	16%	140	17%
145	17%	145	17%	145	18%
150	18%	150	18%	150	19%
155	19%	155	19%	155	20%
160	20%	160	20%	160	21%
165	21%	165	21%	165	22%
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175	23%	175	23%	175	24%
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185	25%	185	25%	185	26%
190	26%	190	26%	190	27%
195	27%	195	27%	195	28%
200	28%	200	28%	200	29%
205	29%	205	29%	205	30%
210	30%	210	30%	210	31%
215	31%	215	31%	215	32%
220	32%	220	32%	220	33%
225	33%	225	33%	225	34%
230	34%	230	34%	230+	35%
235+	35%	235+	35%		

# New VAT Fuel Scale Charge Based on Carbon Emissions Effective from 1st May 2008:

Co2 Band	VAT on 12 month Charge	VAT exclusive 12 month Charge	VAT Fuel Scale Charge 12 month
Below 120	£555.00	£82.66	£472.34
125	£830.00	£123.62	£706.38
130	£830.00	£123.62	£706.38
135	£830.00	£123.62	£706.38
140	£885.00	£131.81	£753.19
145	£940.00	£140.00	£800.00
150	£995.00	£148.19	£846.81
155	£1,050.00	£156.38	£893.62
160	£1,105.00	£164.58	£940.42
165	£1,160.00	£172.77	£987.23
170	£1,215.00	£180.96	£1,034.04
175	£1,270.00	£189.15	£1,080.85
180	£1,325.00	£197.34	£1,127.66
185	£1,380.00	£205.53	£1,174.47
190	£1,435.00	£213.72	£1,221.28
195	£1,490.00	£221.92	£1,268.08
200	£1,545.00	£230.11	£1,314.89
205	£1,605.00	£239.04	£1,365.96
210	£166.00	£24.72	£141.28
215	£1,715.00	£255.43	£1,459.57
220	£1,770.00	£263.62	£1,506.38
225	£1,825.00	£271.81	£1,553.19
230	£1,880.00	£280.00	£1,600.00
235 or more	£1,935.00	£288.19	£1,646.81

## Here are the rates of Vehicle Excise Duty, effective from 13th March 2008:

VED Band	CO2 Emissions	Alternate Fuels	Petrol	Diesel
A	<100	£0	£0	£0
B	101-120	£15	£35	£35
C	121-150	£100	£120	£120
D	151-165	£125	£145	£145
E	166-185	£150	£170	£170
F	186-225	£195	£210	£210
G	226+	£385	£400	£400
LCV	All Vehicles			£180
Euro IV LCV	Registered prior to 1st Jan 2007			£120

The Alternative Fuel tax class includes vehicles constructed to use Bioethanol, or a mixture of Bioethanol and unleaded Petrol, if the proportion of Bioethanol by volume is at least 85%.

The reduced rate of VED for Euro IV Vans will be removed for Vans registered after 31st December 2006; but remain for the lifetime of Vans meeting the requirements registered before that date.

An extra 6 bands will be introduced in 2009/10 with vehicle excise duty graduated from year 1 to year 2. In 2010/11. The highest band will be M with CO2 emissions in excess of 255g/km with a first year rate of £955 and a standard rate of £455.

National Insurance Rates 2008/09 – No Change for Corporates

**Employers will continue to pay 12.8% contribution on the provision of company cars and private fuel.**

## Alternative Fuel Discounts

The current basis for the taxation of cars capable of running on “Alternative” fuel has been simplified. From 6th April 2006 the discounts on “Benefit in Kind” taxation are as below:

2% Discount for Bi-Fuel Gas & Petrol Cars manufactured or converted before type approval

3% Discount for Hybrid Electric & Petrol Cars

6% Discount for Electric Only Cars

These Discounts remain in place however the minimum BIK factor is 10%; except in the case of Type E cars – All Electric where the BIK factor is set at 9%

## Car Sharing

Cutting that in half through car sharing would save 648kg of carbon dioxide over one year, the same as that absorbed by 216 trees.

Sharing a car with someone from work is a great way to not only cut down on the pollution caused by travelling to and from work, but also on the cost. A recent survey has shown that 60% of workers would

be happy to car share to work if there was someone suitable to travel with. Ask around and see if there is anyone coming into work from your direction, it could be a great way to meet new people and network too.

In the last few weeks, a car-sharing lane has been opened for drivers using the M606 and the M62 between Bradford and Leeds. The one-mile lane aims to cut the average peak-time journey by eight minutes by allowing vehicles with more than one passenger to bypass congestion at junction 26 and gain priority entry onto the M62 eastbound. This is one of the first major steps to encourage car sharing in Britain and is definitely a sign of things to come on our roads.

### Did you know?

the average car commuter in the UK drives 19 miles a day?

## Home Working

Recent years has seen a significant increase in the number of people who are based from home and those who chose to work from home a number of days in the week. Technology such as dial-in conference calls, video conferencing and ecommerce means that home working is now more feasible than ever. Reducing the need to travel for business requirements is a great way to reduce your carbon footprint and save on travel and base costs. Consider if you could spend just one day a week working from home or if certain business trips to meetings could be conducted with the use of video conferencing equipment.

## Alternative Transport

Improvements in other transport systems such as buses, trams, undergrounds, trains and cycle paths mean that getting to your destination could be much easier than you think. A little research could mean that you eliminate the need to use your car to get to and from work, be this all week or just for one or two days. Cycling or walking to work will not only benefit the environment and save you money, but will have a positive impact on your health.

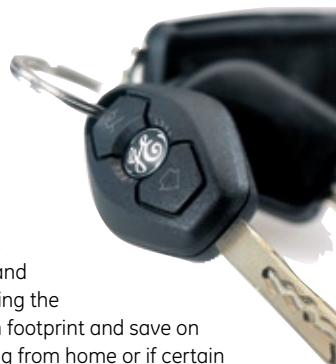
## Cycle Scheme

Have you ever thought about cycling to work? It could not only save you money on travel but also on the gym. 'Cyclescheme' works with independent bike shops to provide tax-free bikes for employees. The scheme aims to get people out of cars and onto bikes benefiting both the environment and your health. If you would like further information about the scheme, please go to [www.cyclescheme.co.uk](http://www.cyclescheme.co.uk).

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UK Head Office  
GE Capital Solutions Fleet Services  
Old Hall Road  
Sale  
Cheshire  
M33 2GZ

T 0870 444 9020  
F 0870 444 2033

[enquiries.fleet@ge.com](mailto:enquiries.fleet@ge.com)  
[www.gefleetservices.co.uk](http://www.gefleetservices.co.uk)

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