





# Show a green set of wheels

The best cars to help you cut your carbon footprint, and how to save money by eco-driving

**S**ir Mark Moody-Stuart, ex-boss of oil giant Shell and leading thinker on climate change, said recently that the EU should ban cars that do less than 35 miles to the gallon. But is this really possible when you consider the cars currently on sale?

In 2005, UK car drivers emitted a total of 69 million tonnes of the 'greenhouse gas' carbon dioxide (CO<sub>2</sub>) – an increase of 41.6 per cent since 1970. The aim is to reverse this rise – but how?

For the average car buyer, mass-market hydrogen fuel-cell vehicles and all-purpose electric cars are still some years away. And filling the gap by using biofuels has increasingly fallen foul of environmentalists, who point out that growing biofuel crops diverts land from basic food production and can

also damage important native forests. All of this has put renewed focus on making existing petrol, diesel and hybrid cars as clean as possible.

You can also save money by doing your bit for the planet – especially in fuel costs and road tax. And in London, Mayor Ken Livingstone has upped the pressure on drivers to abandon the most polluting vehicles in favour of low-emission cars (which will be exempt from the congestion charge – see p76 for more details).

Rightly or wrongly, doing without a car isn't an option for many of us. So in this article we look at low-emission cars that can keep the Chancellor and Mayor Livingstone at arm's length. We also find out how eco-driving can save fuel, and why it will be part of the driving test from later this year.

## USING OUR SUMMARIES

**Price** Guide prices for the specific model featured, not necessarily the whole range. **Road test score** Performance of the car, including pulling power, handling, braking, suspension, seat comfort, heating, dashboard design and interior space. **Reliability** We use data from our

*Which?* Car survey to determine model reliability. **Body styles** The body and door options available. **Gearbox** The type of gearbox fitted to the model tested. Other gearboxes may be less fuel-efficient. **Euro NCap crash test** We give the Euro NCap scores for adult occupant protection. The more stars the better.

## How we test

**Our tests reveal why a car's claimed mpg and CO<sub>2</sub> figures can be so wide of the mark**

One thing you can be sure of is that Which? testing is more rigorous than anyone else's. There's a good reason why our fuel economy and emission figures often don't match the manufacturer's official information.

Official figures are based on results from the EU fuel-test scheme. This measures average fuel economy at both urban and country speeds.

Cars are run in for 1,800 miles and then put through a series of acceleration, steady speed, deceleration and idling exercises. Economy and emissions figures are taken from an average of the two parts of the test, weighted by the distances covered. These 'combined' figures are shown in the tables below.

The Which? test includes the EU urban and country runs but also simulates motorway

driving over a distance of 15.5 miles. The motorway run features acceleration and deceleration, with an average speed of around 68mph. We then take the average of town, country and motorway tests to rate economy and emissions. We find the motorway test helps to give a much more realistic measure of a car's economy and emissions.

None of the models in the tables below is a high polluter, but if you do a lot of motorway driving your car might not be as thrifty as you expect. The Mini Cooper D is a good example – overall it has low emissions and good fuel economy compared with many other cars on the road. But on the motorway cars often use more fuel than in the standard EU test and this releases more CO<sub>2</sub> – so, for many drivers, the Mini Cooper D isn't quite as green as it claims to be.

### FUEL ECONOMY: EU TEST vs WHICH? TEST

	MPG (EU TEST)	MPG (WHICH?)	DIFFERENCE (%)
MINI Cooper 1.6 D	72.4	53.3	-26
BMW 118d	62.8	48.7	-22
TOYOTA Aygo 1.0 MMT	61.4	48.7	-21
SKODA Fabia 1.4 TDI	61.4	49.6	-19
VW Polo BlueMotion 1	74.3	60.1	-19

### CO<sub>2</sub> EMISSIONS: EU TEST vs WHICH? TEST

	CO <sub>2</sub> g/km (EU TEST)	CO <sub>2</sub> g/km (WHICH?)	DIFFERENCE (%)
MINI Cooper 1.6 D	104	133	+28
BMW 118d	119	150	+26
VW Polo BlueMotion 1	99	125	+26
SKODA Fabia 1.4 TDI	120	145	+21
TOYOTA Aygo 1.0 MMT	109	131	+20



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### A FUNCTIONAL TAX BEATER

## VW Polo BlueMotion 1

£12,070 to £12,670

Volkswagen's Polo BlueMotion may not be revolutionary, but it's certainly evolutionary – showing that carmakers can refine existing technology to hit green targets when they need to.

A low nose, lightweight alloys and rear spoiler arguably improve the looks of the standard Polo's staid functional design. A diesel particulate filter (or DPF – see 'Jargon buster', p76) is fitted as standard to reduce soot-like emissions and improve local air quality.

The BlueMotion's five-speed manual gearbox is deliberately long-legged to boost economy, particularly between third and fourth gears – you'll find yourself changing up at around 60mph instead of 30. Even so, this 78bhp diesel feels quite sprightly. The engine is noisy when stationary, but OK on a run.

We managed 60.1mpg in our test of the BlueMotion 1, giving a range of nearly 600 miles for the 45-litre tank – so any Londoners heading to Inverness shouldn't need to plan in fuel stops. That's impressive – but 19 per cent off VW's claimed 74.3mpg figure.

Crucially, the BlueMotion 1 claims to emit CO<sub>2</sub> at a rate of just 99g/km, making it exempt from road tax – which is nice. In our tests (see opposite) emissions reached 125g/km due to the lower mpg figures we observed. The heavier BlueMotion 2, with spare wheel and air-conditioning, emits 104g/km (claimed) and falls into road tax band B, attracting an annual fee of £35.

**VERDICT** A practical, tax-beating supermini with truly low emissions.

Road test score 60% Reliability Too new to say  
Body styles 3- and 5-door hatchback Gearbox 5-speed manual Euro NCap crash test ★★★★★

**Londoners heading to Inverness shouldn't need to plan in any fuel stops**



### GOOD, CLEAN FUN – BUT CRAMPED

## Mini Cooper 1.6 D

£14,415 to £16,425

The Mini has injected some real fun into greener driving. The diesel powerplant has taken little away from the enjoyment of this iconic little car.

The 1.6 diesel engine drones, but it puts out 110bhp and feels lively. Bags of low-end pulling power produces brisk acceleration, and gear changes are slick. Sweet handling adds to the Mini's rewarding overall drive.

But we found the claimed figures of 104g of CO<sub>2</sub> per kilometre and 72.4mpg to be very optimistic. We measured 133g/km and 53.3mpg.

All models have a DPF (see 'Jargon buster', p76) and in 2007 the whole Mini range was upgraded to include BMW's fuel-saving stop-start system – explained in more detail in our review of the 1 Series diesel, overleaf.

The manual gearbox is a greener option than the automatic. It offers drivers better fuel economy and lower emissions, which means manual Cooper Ds will avoid the London congestion charge from October.

Sadly, the Mini really falls down on its practicality. The back is cramped and best left to small children. And at just 155 litres, the boot is puny – enough for a few shopping bags but barely sufficient for a weekend away.

Singles and couples with a taste for retro features are sure to be tempted. Prices are steep, but the chic Mini brand guarantees solid resale values.

**VERDICT** The Mini Cooper D pulls off the difficult task of blending green credentials with a keen drive.

Road test score 61% Reliability Too new to say  
Body styles 3-door hatchback Gearbox 6-speed manual Euro NCap crash test ★★★★★



### EASY-TO-PARK CITY RUNNER

## Smart ForTwo Coupé

£6,815 to £8,935

The second generation of the two-seat Smart ForTwo addresses many of the complaints levelled at its predecessor. Outside, a longer wheelbase and body are designed to improve stability and create room for taller passengers. Inside, the characteristic dashboard details have been retained.

We recorded 47.1mpg in our tests, which isn't bad – but quite a way short of Smart's official 57.6. In terms of CO<sub>2</sub> emissions, the 134g/km we observed is higher than Smart's published 116g/km.

Living up to its billing, the ForTwo is best suited to the city – you're almost guaranteed to get a parking space. The view from the driver's seat is good and the car's dimensions are easy to gauge. All models in the range (except the Brabus) will be exempt from the London congestion charge from October.

The Mitsubishi-supplied 1.0-litre petrol engine delivers more power than the old model (84bhp versus 61bhp) and, despite the car's short wheelbase, the suspension handles small potholes reasonably well.

The Smart's main downfall is its lack of flexibility. The 84bhp version we tested easily reaches motorway speeds, but cruising at 70mph is tiresome due to excessive road and engine noise.

Its range is quite small, at 342 miles from a 33-litre tank, so you need to plan regular fuel stops. The boot is also tiny, at just 110 litres.

**VERDICT** A reasonably green city car, but its lack of flexibility won't suit drivers who often venture out of town.

Road test score 61% Reliability Too new to say  
Body styles 3-door hatchback Gearbox 5-speed semi-automatic Euro NCap crash test ★★★★★



#### EFFICIENT BABY BEAMER

### BMW 118d

£18,345 to £21,435

During the past year, BMW has been overhauling its car range by tweaking engines and honing aerodynamics in the pursuit of greater fuel efficiency.

One change that may have slipped under your radar is the introduction of stop-start technology. This system switches off the engine when you select neutral at the lights or in traffic – to cut emissions in urban areas. The engine re-engages as soon as you push the clutch. It also uses regenerative brakes (see 'Jargon buster', p76) to capture energy that would normally be wasted without a full hybrid system.

BMW has upped the power output of the 118d's 2.0 diesel engine from 122 to 143bhp, but with the help of stop-start it has simultaneously improved economy – no mean feat. We averaged 48.7mpg in our tests – 22 per cent lower than BMW's 62.8mpg, but this still equates to 567 miles from a full 53-litre tank. Our CO<sub>2</sub> emissions figure of 150g/km is higher than the official 119g/km but a welcome step in the right direction for a car with such spirited performance.

The 1 Series is still the ugly duckling in the BMW family, despite its 2007 face-lift. However, sales are strong among younger buyers looking for a leg up on to the BMW ladder. If you're happy to pack light – it's not the largest medium hatch – you can enjoy the excellent handling without feeling too guilty about your carbon footprint.

**VERDICT** Few eco-makeovers are as smart as this – it marries elements of a hybrid car with normal diesel power.

Road test score 65% Reliability Average  
Body styles 3- and 5-door hatchback Gearbox 6-speed manual Euro NCap crash test ★★★★★



#### FUTURISTIC AND FRUGAL

### Citroën C4 1.6 HDI

£14,710 to £17,010

The C4 has been around for a few years now but still boasts handsome looks, even when compared alongside many newer rivals.

The C4's curves do more than just look pretty. Air resistance and fuel consumption are minimised by the flattened and streamlined body shape and by Citroën's efforts to smooth out the car's underside. To reduce weight, some parts are made of aluminium.

It has plenty of zip for overtaking and is great for fuel economy. In the 1.6-litre (110bhp) five-door diesel we measured 54.3mpg – shy of the claimed 62.8mpg. The 60-litre tank has a potentially huge range of 716 miles – enough for a trip from London to the French Riviera.

Carbon dioxide emissions are low, at just 138g/km, but not quite as good as the claimed 120g/km. To keep sooty emissions down, ensure a DPF is fitted, because this isn't supplied on all C4s.

Inside, you get a lot for your money – it's well equipped and despite the squat shape the 315-litre boot is about average for a mid-sized hatchback. Safe, quiet and good to drive, this C4 is worth an entry on most shortlists.

However, depreciation is high – although there's every chance you'll be able to get a great deal to offset this. More of a problem is the C4's suspect reliability – we'll wait to see how it fares in our 2008 *Which?* Car survey.

**VERDICT** For its ability to dodge fuel pumps, the C4 deserves a medal. But its reliability and steep depreciation might put off potential buyers.

Road test score 60% Reliability Below average Body styles 3- and 5-door hatchback Gearbox 6-speed semi-automatic Euro NCap crash test ★★★★★



#### GROUND-BREAKING HYBRID

### Toyota Prius

£17,712 to £20,612

No test of green cars would be complete without the ground-breaking Prius – and for good reason. It's the only hybrid car to truly crack mainstream markets across the globe.

The innovative petrol-electric system cuts emissions in several ways. The electric motor helps the petrol engine when accelerating and powers the car at lower city driving speeds. In jams or when waiting at traffic lights, the Prius saves fuel by switching from petrol to electric power, creating an eerie hush.

Unlike a fully electric car, there's no need to charge the battery from an external source, as the battery stores power while on the move.

Emissions are very low, although not quite as planet-friendly as the claimed 104g of CO<sub>2</sub> per kilometre – 123g/km in our tests. That's lower than the VW Polo BlueMotion and is particularly good for a large 1.5-litre petrol car. As you might expect, fuel economy figures are not to be sniffed at. In our tests the hybrid engine managed 54.3mpg – down on the official 65.7mpg, but still superb for a petrol family car. A tankful should last 537 miles, based on our economy stats.

A major ingredient of the Prius's success has been its versatility. There's plenty of room for the family and for shopping. It handles well, despite a firm ride, and it can tackle motorway runs, even if it's not at its most refined or efficient in this context.

**VERDICT** The Prius is expensive to buy compared with some clean diesels – but wins points for its quiet drive.

Road test score 62% Reliability Good  
Body styles 5-door hatchback Gearbox CVT auto Euro NCap crash test ★★★★★

To reduce weight, some parts of the C4 are made of aluminium



**HONDA'S HYBRID CHALLENGER**

## Honda Civic Hybrid

£17,120 to £19,620

The Civic is Honda's slightly cheaper answer to the Prius. The CVT gearbox (see 'Jargon buster', p76) is smooth, and manages to pair the 1.4 petrol engine with battery power effectively.

In the city the electric motor comes into its own, supplying up to 20bhp and extra low-speed torque to ensure a fairly nippy ride. But at higher speeds, this hybrid struggles for pulling power.

As in many modern cars, a 'drive-by-wire' electrical sensor is used to precisely control the link between the accelerator pedal and the throttle, and as you slow down, regenerative brakes recharge the batteries. But the pedal-feel of the brakes is a bit weird and the system occasionally makes odd noises.

The Civic falls short of matching the Prius for fuel consumption and carbon emissions. We measured economy at 51.4mpg, down on the claimed 61.4mpg, and CO<sub>2</sub> emissions at 126g/km instead of Honda's official 109g/km.

The Hybrid shares much with the normal Civic hatchback but misses out on some of its futuristic angles. It's available only as a saloon, due to the big battery pack behind the rear seats. Front and rear leg- and headroom is good, but luggage space is limited.

Owners have reported some early reliability issues with the latest Civic hatch – it remains to be seen whether the Hybrid version is different enough to avoid similar problems.

**VERDICT** It may not have the profile of the Prius, but this is a solid and cheaper attempt at greener motoring.

Road test score 54% Reliability Too new to say  
Body styles 5-door saloon Gearbox CVT auto  
Euro NCap crash test ★★★★★

**FAMILY-FRIENDLY ECO-SALOON**

## VW Passat BlueMotion

£17,260

The new Passat BlueMotion slots straight into VW's 'greener' range. Importantly, it's a genuine family vehicle with very few compromises.

Unlike the Polo BlueMotion, with its obvious body tweaks, the difference between a BlueMotion Passat and the regular model is harder to spot.

However, it has undergone several modifications to encourage fuel savings. The chassis has been lowered, and a DPF (see 'Jargon buster', p76) comes as standard. Its wide gear ratios often require shifting down and running at high revs to achieve good acceleration. But overall it's balanced, handles well and drives confidently.

The 1.9 TDI engine returned 54.3mpg in our test, which is very close to the 55.4 mpg claim. We also found that VW's official CO<sub>2</sub> figure was almost spot on – we registered a low 137g/km compared with the stated 136g/km.

Inside, the cabin is cavernous, with plenty of elbow- and headroom. With the rear seats folded, the 475-litre boot can expand to 815 litres for outings.

Sadly, our 2007 *Which?* Car survey revealed that diesel Passats are poor for breakdowns and have a tendency to develop annoying faults and niggles. However, this car's green credentials are founded on slightly different engine technology, so it's possible the Passat BlueMotion will escape the same problems – only time will tell.

**VERDICT** A huge family car with little thirst for diesel and very low emissions. Resale values should be strong.

Road test score 69% Reliability Too new to say Body styles 4-door saloon, 5-door estate (£18,395) Gearbox 5-speed manual Euro NCap crash test ★★★★★

## Insider information

### Our motoring researcher, David Evans, explains how eco-driving can save money – and stress

It may be a bitter pill to swallow, but most scientists agree that driving isn't very kind to the environment – so it's important to reduce our carbon footprint if we can.

The aims of eco-driving are straightforward enough – to save fuel and cut emissions. Company car drivers have been able to go on eco-driving courses for several years, but wider interest will be raised by the inclusion of eco-driving in the driving test.

From September, examiners will make an eco-driving assessment of learner drivers, although doing badly won't result in a fail. At the moment the focus is on giving feedback to improve driving techniques. The Driving Standards Agency says most drivers should see around an 8 per cent fuel saving from eco-driving.

I attended a one-day training course at Absolute Fleet Training, near Derby, for £300. The day consisted of two journeys around a prescribed route interspersed with coaching. On the first run I drove normally to gauge my benchmark fuel usage. Handling, anticipation, safe positioning,

speed and gear changes were all examined.

During the day we worked on improving performance through driving style. The difference was striking – fuel savings were around 45 per cent between the two runs. Since the course I'm getting around four miles more to every gallon, which is very handy when prices are so high. I'm also much more relaxed behind the wheel.

### Eco-driving tips

If you want to save money by eco-driving, here are a couple of tips to get you started.

- Honing your observation and anticipation skills is essential. Plan routes before travelling and keep a close eye on the road ahead to avoid stopping unnecessarily when approaching lights or roundabouts.
- Accelerate smoothly and minimise the number of gear changes. Ease off the gas where possible to lower fuel consumption and use the highest gear available – but without labouring the engine. Keeping the revs between 1,500 and 2,500rpm should help.



## Jargon buster

### Green technology explained



Filter papers show the drop in soot emissions from an old diesel (right) to a modern one with a DPF (left)

■ **CVT** Unlike a conventional automatic gearbox, a continuously variable transmission can change steplessly through several effective gear ratios. It should boost fuel economy because the engine operates in its most efficient rev range for the speed.

■ **DPF** A diesel particulate filter traps up to 100 per cent of soot particles from the exhaust gas of a diesel engine to improve local air quality. A must for 'clean' diesels.

■ **DRIVE BY WIRE** A system that uses an electronic position sensor to connect the accelerator pedal to the fuel-injection unit, rather than a traditional mechanical link. It's more precise, so saves on fuel.



Hybrid energy display in the Prius

■ **HYBRID** A car that combines a conventional petrol engine with a rechargeable electric motor to achieve better fuel economy. Batteries are recharged during normal driving, via the alternator and regenerative brakes.

#### ■ REGENERATIVE BRAKES

These reduce fuel use by recouping the 'wasted' energy from braking. Captured energy is stored in a battery to power an electric motor or, in BMW's stop-start system, to take some load off the normal engine when driving.

## What else can you buy?

### Our pick of other cars that promise to eke out fuel and save on tax



**SEAT IBIZA ECOMOTIVE**  
**£10,995 TO £11,625**

The Ibiza is cheaper and less boxy than the Polo BlueMotion but shares the same emission-busting trickery. A claimed CO<sub>2</sub> level of just 99g/km means it's exempt from road tax.



**PEUGEOT 308 1.6 HDI DIESEL**  
**£13,295 TO £14,795**

Peugeot's new 308 is a competent car, but you should haggle hard to get it at a reasonable price. Peugeot's figures say this 90bhp diesel will

return 62.8mpg and emit 120g/km – that's £35 a year road tax.



**VOLVO C30 1.6D**  
**£14,750 TO £16,600**

This distinctive, sporty-looking hatch seats only four but is a credible alternative to BMW's 1 Series. Volvo says CO<sub>2</sub> emissions are 129g/km and fuel economy is 57.6mpg. A C30 'Efficiency' model is due soon.



**VW GOLF BLUEMOTION**  
**£15,565 TO £16,745**

VW's burgeoning BlueMotion range is

completed by this 1.9 TDI Golf version. Low rolling resistance tyres, a streamlined underbelly and the now-familiar wide gear ratios help its claimed CO<sub>2</sub> emission figures sneak below 120g/km (£35 a year tax). Fuel economy is said to be 62.8mpg.



**BMW 318d**  
**£23,695 TO £27,015**

The 3 Series has brought premium motoring to the masses, so the greener it is the better. This refined diesel version uses a DPF, sleek aerodynamics and the stop-start system to produce claimed CO<sub>2</sub> figures of just 123g/km and an impressive 60.1mpg.



**SKODA FABIA 1.4 TDI**  
**£9,755 TO £12,030**

The latest Fabia is a bit bigger than its predecessor. The 80bhp 1.4 TDI model averaged 49.6mpg and CO<sub>2</sub> emissions of 145g/km in our tests, but is well off official figures (see p72).



**TOYOTA AYGO 1.0 MMT**  
**£6,860 TO £8,110**

The Aygo claims a low CO<sub>2</sub> figure of 109g/km, so it will be exempt from the London congestion charge later in the year. Our test noted emissions at a higher 131g/km.

## London's new 'CO<sub>2</sub> charge'

### The congestion charge is rising to £25 for gas guzzlers – and many normal cars, too

From 27 October the London congestion charge will rise from £8 to £25 a day for the highest-polluting cars, but it's not just 4x4 owners that will be hit by the increase. Transport for London estimates around 33,000 vehicles will be affected every day, many of them ordinary large family cars and MPVs.

For example, both the Vauxhall Zafira 2.0-litre petrol and Honda Accord Tourer 2.4-litre petrol will be subject to the higher fee because their CO<sub>2</sub> emissions are above the 225g/km threshold. Meanwhile, larger models you might

expect to fall foul of the changes, such as diesel versions of the BMW X5 and Jaguar XF, do not.

At the other end of the scale, some cars – including the BMW 118d, Mini Cooper D and VW Polo BlueMotion – with emissions below 120g/km will become exempt from the charge.

Cars registered before March 2001 will be excused from the higher £25 charge, unless the engine is 3.0 litres or bigger. However, owners will still need to pay the regular £8 daily levy for entering the zone. Visit [www.which.co.uk/cars](http://www.which.co.uk/cars) for more information on these changes.