

Driving Change.

**New report reveals
dynamics shaping
consumer demands
in 2008.**



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FOREWORD

There can surely now be little doubt that the last few months have seen our society, culture and economy shift to new and unprecedented paradigms. Basic assumptions about the ways in which we live our lives are being shaken. Fundamental ideas are being challenged. Individuals and businesses alike find themselves confronting new issues, reassessing priorities, and acting to safeguard the things that matter most.

Challenging times, then. But tackling challenges can make us stronger. Challenges drive innovation. They inspire us to make the most of what we are and what we have. And in meeting one challenge, we often find we have generated improvements in entirely different areas of our lives and business.

This is how BMW regards its business of making cars.

Right now, car manufacturers face some serious challenges. For obvious reasons, it is essential that cars become more fuel efficient. Drivers acknowledge this, and are keen to embrace new, fuel-efficient technology, but in general they are unwilling to forgo what matters most to them about their cars – performance and economy. For BMW, that means making cars more efficient with no compromise to the character they are used to.

BMW has long been committed to both maximising the driver's pleasure and minimising the impact of its operations and cars on the environment. In recent years the company's engineers have embodied these commitments in BMW EfficientDynamics, a programme dedicated to constantly improving the efficiency of the cars we produce and pushing the boundaries of sporty driving. BMW EfficientDynamics has so far allowed the company to do more than any other major car manufacturer to improve efficiency and reduce emissions whilst also improving performance, as this report shows. It has a key role to play in meeting drivers' demands, now and in the future.

Richard Hudson
Marketing Director
BMW (UK) Ltd.

INTRODUCTION

Consumers see motoring as a key area where they can both save money and do the right thing environmentally, but they are not prepared to compromise on their driving experience or image. These are the main findings of this report, Driving Change, which include results from a recent survey carried out by pollster YouGov on behalf of BMW.

The report reveals that car owners are focusing on economic rather than environmental factors when choosing to drive low-emission vehicles, while maintaining their high expectations of performance and driving enjoyment.

Most people (61%) believe that cost is the most important consideration when buying a more environmentally friendly car. Asked why they thought people choose to drive a greener car, 59% of respondents identified lower bills as being the main reason whereas only 13% cited lower emissions as being the key motive.

While drivers are open to environmentally friendly cars, they still demand a high level of performance from their vehicles. 14% of respondents cited driving experience as being the most important factor when choosing a car, while a perceived compromise in performance worried 19% of people the most.

BMW's focus on making existing combustion engines more fuel efficient by using technologies which feature in the initial phase of its EfficientDynamics programme ensures that all cars and customers receive benefit rather than just one 'halo' car in the range. This is what today's premium driver is looking for – accessibility and no compromise.

BMW has a 35-year history of environmental innovation, and leads the global motor industry in emission-reduction technology (as shown in the main body of this report). The BMW EfficientDynamics principle ensures engineers are continuously evaluating ways in which BMW models can be significantly more fuel-efficient whilst continuing to develop the driving experience to improve performance. The principle has led to an evolving array of innovations that benefit the driver by reducing fuel consumption and emissions levels – and saving them money.

Saving money is uppermost in the minds of British households at the moment. For example, according to the British Retail Consortium, food inflation in the 12 months to August 2008 stood at 10%. This means that a family spending £100 a week on food a year ago is now spending an extra £520 per year.

Meanwhile, according to the National Housing Federation, the average household energy bill has increased from £676 a year in 2005 to £1,300 today. But it is unrealistic to expect many households to save money by disposing of the family car, which is needed for almost every activity in modern-day living.

For those who want premium motoring driving a more fuel-efficient vehicle, they can secure the drive experience they want while saving hundreds of pounds annually in petrol or diesel costs alone. For example, the BMW 118d and 123d Coupé respectively use £110.23 and £127.52 less fuel per 10,000 miles than their next most fuel-efficient competitor.

And the savings do not stop at fuel. Motorists who buy lower-emission vehicles pay less in car taxes, while higher-polluting cars are more likely to depreciate at faster rates than lower-emission vehicles.

As Driving Change will reveal, BMW's programme puts it at the forefront of an exciting new movement in engineering, one that uses technological solutions to achieve outstanding results. Cleaner technology is driving a period of innovation, excitement and creativity not seen since the industrial revolutions of the 18th and 19th centuries, resulting in new sectors like low-carbon luxury house builders, fuel-efficient airlines and geothermal power generators. BMW is proud to be playing a leading role in the premium automotive sector.

"BMW EfficientDynamics means that businesses and individuals who appreciate cars that are great to drive can finally choose green cars that aren't slow, ugly and quirky," says Paul Clarke, founder of Green-Car-Guide.com.

KEY FINDINGS

Working from results of the recent BMW YouGov plc poll¹, which surveyed 2,068 adults, consumers' real concerns were analysed against perceived greener choices when it comes to reducing their carbon footprint:

- 75% would only buy a lower-emissions car if it saved them money.
- 17% of men state that experience is the most important factor when buying a car, more so than cost, image or carbon footprint.
- Women are at least twice as likely as men to prioritise carbon footprint in all areas of lifestyle. When buying a car, 25% of women state carbon footprint is the most important factor, compared to 15% of men.
- Perceived reduced performance is the main worry when it comes to buying a more environmentally friendly car. The opposite is in fact the reality of BMW EfficientDynamics equipped cars – where technologies mean a higher level of performance while improving consumption and emissions.
- One in five people recognize carbon footprint as their chief priority when buying a new car; rewind to June 1988 when Ipsos MORI interviewed 1,000 respondents in its survey, The Most Important Issues Facing Britain Today, and not a single person thought that pollution/environment was a concern.
- Despite popular opinion, current hybrid vehicles can have shortcomings and are not always the cleanest and most efficient cars. (Much depends on the type of driving and distance individuals need to travel). The survey reveals that the majority of people (54%) correctly believe that a diesel-engined car is more efficient over long distances than a current hybrid.
- There is overwhelming support (72%) for Government to implement financial incentives for these types of more environmentally friendly car purchases.
- When asked which areas of household spending people would economise on soonest, only 6% said motoring – the highest was entertainment (41%), holidays (34%) and household bills (15%).

1. All figures, unless otherwise stated, are from YouGov plc., commissioned by BMW. Total sample size was 2,068 adults. Fieldwork was undertaken between 15th-18th August 2008. The survey was carried out online. The figures have been weighted and are representative of all GB adults (aged 18+).

SECTION ONE

THE DILEMMA - What 21st century consumers really want

A) New priorities in tightening economy

In a climate of credit crunch, increased oil prices and CO₂-based road taxes, car owners are focusing more on economic reasons for choosing lower-emission vehicles than environmental motives, according to the BMW survey.

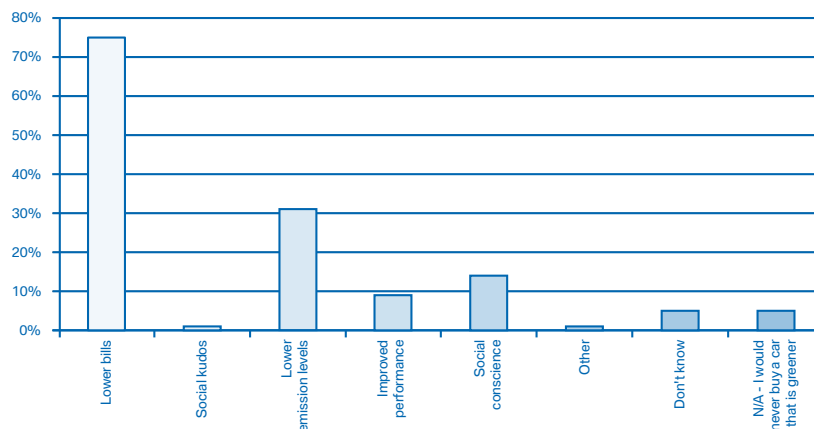
Cost was the reason why an overwhelming three quarters of people surveyed (75%) would buy or had bought a more environmentally friendly car themselves. Specifically, more miles to the gallon (37% of respondents) win over lower road tax (33%).

Driving Change also reveals:

- Almost two thirds of people surveyed (61%) believe that cost is the most important consideration when others buy a more environmentally friendly car.
- 59% thought the main reason other people choose to drive such cars was to reduce their bills by improved fuel consumption and lower road tax.
- While just 13% of respondents identified lower emissions as a reason why others buy a more environmentally friendly car.

As consumers continue to worry about the economic downturn, it follows they are looking to purchase more fuel-efficient vehicles to offset the rising cost of fuel.

Why people would buy a more environmentally friendly car



“Given the economic slowdown, people want to save their own bank balance. If they help the planet along the way, that is a bonus,” says Jay Nagley, publisher of www.cleangreencars.co.uk, a website which advises on cars from an environmentally considerate perspective. “They will increasingly expect high efficiency from their cars. Even if they could afford to pay high fuel bills, it will become socially unacceptable to be seen as wasteful.”

Cars that offer more miles per gallon whilst ensuring premium driving performance represent a financial saving over the long term. BMW sees this as a clear business opportunity.

“There is nothing wrong with looking to the world’s best engineers, designers and technologists,” Martin Ertl, BMW Innovations Manager, says in *The Secret Life of Cars – and What They Reveal About Us*, a study into the relationship between vehicles and their owners, “to seek to combine the pleasure of acting positively to save the environment with the joy associated with driving the cars we love.”

So rather than focusing on just one solution to improve fuel efficiency, BMW EfficientDynamics is an umbrella of current and future technologies, which will introduce several approaches over time. These include:

- Today, BMW believes the answer lies in a suite of technologies designed to improve fuel efficiency. These innovative advances increase power without requiring a change to driving style or behaviour. All new BMW models employ the technologies that offer increased efficiency levels without any sacrifice of driving enjoyment.
- BMW’s forthcoming ActiveHybrids, a unique concept which combines the torque of the electric motor with the efficiency of a BMW petrol engine. The ActiveHybrid even adapts itself according to the driving situation and has an energy-management system to further reduce fuel use and CO₂ emissions.
- And the future lies with the BMW Hydrogen 7, the first ever series-production car to be powered by hydrogen, offering emission-free motoring.

B) Experience matters

Just as important as financial factors, Driving Change reveals that 21st century consumers are not prepared to compromise on the actual experience – whether that’s a holiday of a lifetime, a luxurious home or a powerful and sporty car:

- When it comes to driving, 17% of men cite driving experience as the most important factor when buying a car. More so than carbon footprint (15%) and even image (7%).
- Almost half (47%) of respondents cite experience as the most important factor when choosing a holiday, compared to 8% citing carbon footprint.
- And 48% of those surveyed prioritise experience when buying entertainment, with just 3% considering impact on the environment.

The results also indicate that while drivers are open to lower-emission cars, it is conditional – they will not compromise a dynamic driving performance. When asked specifically about buying an environmentally friendly car, the experience itself was front of mind – a perceived compromise in performance worried nearly one in five people (19%).

And it seems that even in tight economies, driving is one area where consumers are less keen to cut financial corners – the performance is too important. Only 6% would economise on motoring, but instead would look to entertainment (41%), holidays (34%) and household bills (15%) as areas to make savings.

In an age where technology is improving – the BMW 320d Saloon can now achieve 70mpg as well as a top speed of more than 140mph – consumers are reaping the rewards.

So these consumer demands present manufacturers with a dilemma. The pressure is on industry to deliver – while costs and emissions must go down, premium performance and experience must continue to go up.

Not all businesses can achieve this.

“BMW are the leaders here,” says Jay Nagley, of Clean Green Cars. “The EfficientDynamics package is the most successful way we have yet seen of reducing emissions without reducing performance.”

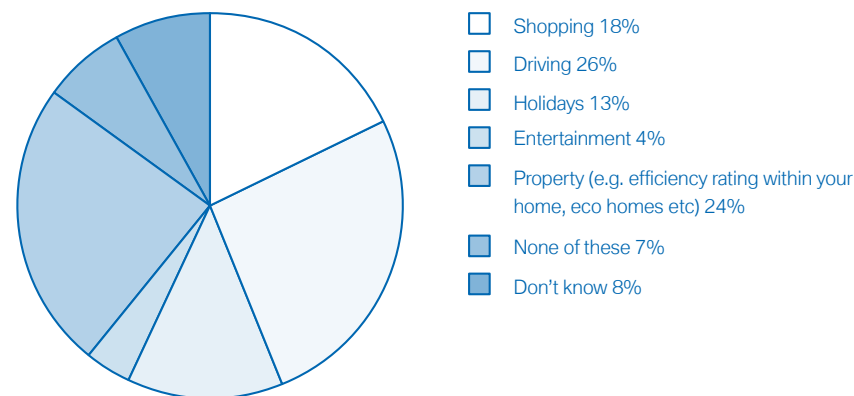
“People have been buying cars with steadily higher performance for over 20 years now – the average power output of a car sold in Britain has gone up from 80hp in 1986 to 125hp last year. People are not going to go back to 80hp – they want the same performance but higher efficiency.”

C) Carbon footprint – do we care?

Having established the importance of economics and personal experience, Driving Change explored the influence of carbon footprint on purchasing decisions.

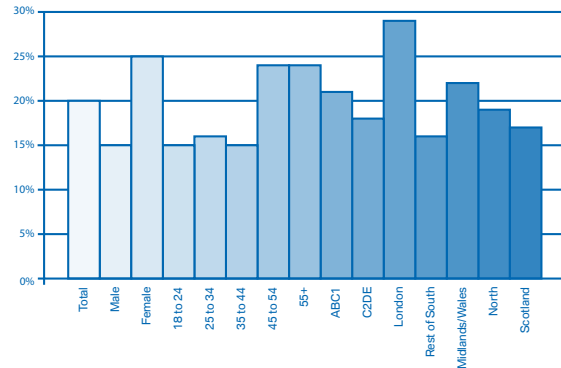
When asked which area of our lifestyle offers the greatest opportunities for reducing carbon footprint, driving was highlighted. Over a quarter (26%) currently see driving as the key area for reducing carbon footprint. That’s higher than for any other area (shopping, property, entertainment) – and one in five people now cite carbon footprint as their chief consideration when buying a new car.

Which area of your lifestyle do you believe you have the most control over in terms of your carbon footprint?



- This shift is led by women: 25% cite carbon footprint as the most important factor when buying a car, compared with just 15% of men.
- For those aged 45-54, 24% deem it the most important factor compared with 15% of 36-44-year-olds.
- Londoners lead the way in placing carbon footprint ahead of cost; 29% put carbon footprint as a priority.
- Curiously perhaps, given one might assume London had an influence, the rest of the South was the most diverse (with 16% prioritising carbon footprint as the most important factor and 63% favouring cost).
- The Midlands and Wales came a close second (22%/57%).
- Experience was valued roughly the same everywhere, and image fluctuated only a little, with northerners the least image conscious and the Midlands/Wales the most.

Total variations of the prioritising of carbon footprint



D) Motives for more efficient driving

The BMW research reveals that almost a quarter of respondents (24%) who live in London cited social conscience as a reason for focusing on cleaner driving, while 14% did so nationally. This is the second most significant reason for purchasing a more efficient car.

This viewpoint may stem from a social pressure to consider CO₂ emissions. In fact, the real motivators for people to buy more efficient cars are personal financial benefit and high performance or quality.

Again, the suggestion is that there may be a social pressure, which in extreme cases can lead to feelings of guilt when it comes to car purchases, but generally this is set aside. Consumers believe they can let the car manufacturers resolve the CO₂ issues; they simply want to enjoy a superior driving experience. This attitude fits in with the BMW EfficientDynamics programme which offers greater economy without requiring any compromise to increased performance, accessibility and driving behaviour.

Incentives versus penalties

According to the new BMW data, a huge percentage (over 70%) believes the Government should offer financial incentives for driving more efficient cars. The emphasis, of course, is on incentive; you would not expect the public to support penalties for less efficiency.

The highest percentage, at 79%, was in Scotland who agreed with incentives, and even the smallest number in agreement was high (69% of those in the south). Only 18% said they thought the Government should not do this, with 10% unsure. This supports the fact that money plays a key role not just at the time of the initial purchase decision but is a consideration with regard to additional/related costs.

E) What drives sales in other lifestyle sectors?

To understand the needs of the modern consumer, it helps to compare purchase decisions in driving to other lifestyle sectors.

Environmental awareness and personal relevance

Dependent on age and gender, research reveals that different 'groupings' of people believe they can influence their carbon footprint in various ways. For example:

- Almost a quarter (23%) of women believe shopping is the area in which they can best reduce their carbon footprint, as against 13% of men.
- But more men (32%) than women (21%) believe that driving is the area in which they can best reduce their carbon footprint.
- Meanwhile, 11% of 18-24 year-olds believe that entertainment is the area in which they can best reduce their carbon footprint compared with just 2% of 35-44s.

This may suggest that areas which hold the most enjoyment or relevance to individuals are the ones in which we are likely to prioritise changes to behaviour – consumers prioritise what is most important to them personally.

Older people regard the environment as more of a priority

Older and wiser? A popular notion is that an environmental awareness is highest among the young, but this masks other significant trends. Driving Change reveals that women and older people are more likely to prioritise carbon footprint when making purchases.

- Across all areas of lifestyle, the over-55s are the highest percentage of people prioritising the environment in their purchasing decision.
- 24% of over 55s state carbon footprint is most important when buying a new car, compared to just 15% of 18-24 year-olds.
- When buying property 13% prioritise carbon footprint, compared to only 4% of 25-34-year-olds.

When it comes to shopping, women are more than twice as likely as men to prioritise carbon footprint

The research also highlights that in all areas of lifestyle, women are at least twice as likely to prioritise carbon footprint. For example:

- 12% of women compared to 5% of men prioritise carbon footprint when purchasing property.
- And 25% of women (compared to 15% of men) when purchasing a car.

In summary then, these consumer insights disclose the importance of cost and experience as overriding influences on purchasing decisions. Alongside this, there is a consideration for the environment and a suggested expectation for manufacturers to deliver. Is industry meeting the concerns and demands of consumers?

SECTION TWO

THE SOLUTION – A new efficiency movement

Just 20 years ago, opinion pollster Ipsos MORI* recorded that not one of its 1,000 respondents was concerned about the price of fuel. But times are changing – 16% of those questioned in the BMW research in 2008 voiced this concern. Likewise, the consideration of environmental impact jumps from zero in June 1988 to 9% in June 2008.

With changing consumer demands to reduce energy consumption and emissions, while maximising performance, how is the automotive industry responding?*

Driving Change reveals the evolution of the cleaner technology movement – the creation of innovative technological solutions which allow consumers to save energy and improve the environment without sacrificing quality or any compromise to lifestyle.

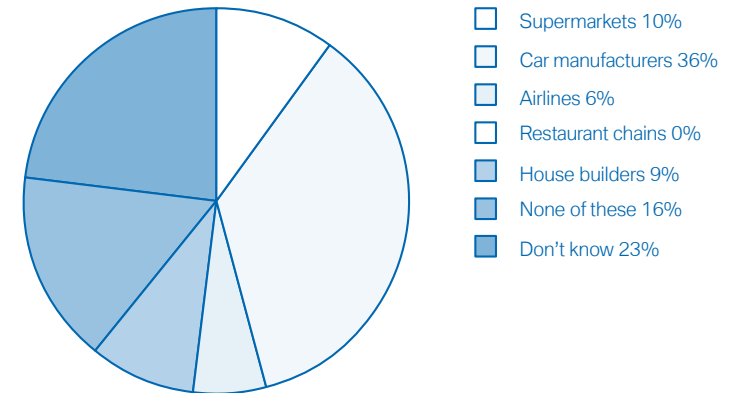
A) Public recognition of the car industry

A substantial number of people accept that motoring technology can help with the drive to reduce our carbon footprint. Over a third (36%) of those surveyed believe the car manufacturing industry has done the most, compared with other sectors over the past two years, to reduce emissions.

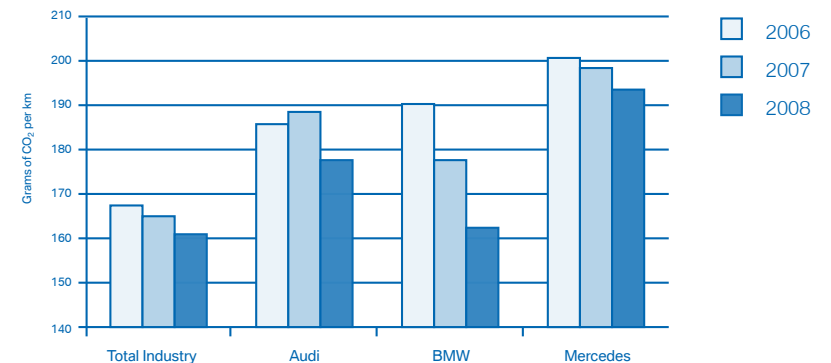
How far the car manufacturing industry has actually come is shown in the two charts below, which both span 2006 to 2008. It can be seen that BMW in particular has cut its CO₂ output over the period to almost match the level of the total industry reduction.

*Source: <http://www.ipsos-mori.com/content/the-most-important-issues-facing-britain-today.ashx#1998>

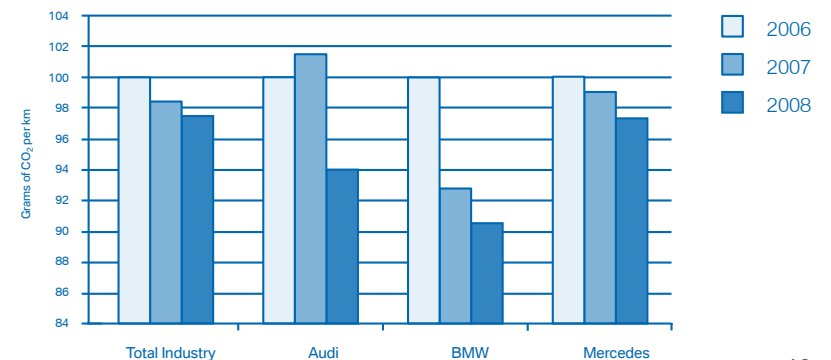
Sectors which have achieved the most in the last two years in reducing their CO₂ emissions



Average CO₂ output 2006 - 2008, grams per km



CO₂ improvements 2006 - 2008. 2006 = 100



B) The move to cleaner technology – motoring and beyond

Valuable innovations can be seen in industries beyond car manufacture, such as Boeing's Dreamliner and Barratt's Green House.

For example, flying may be viewed as sustainable as long as the airline industry's carbon footprint is lowered and shows a programme of continued improvement. Virgin Atlantic has ordered 15 new Boeing 787 Dreamliner aircraft because they burn around 27% less fuel per passenger than the A340-300 they will replace. This is due to new engines, less weight, more efficient systems and advanced aerodynamics. This super-efficient aircraft offers lower cost of travel in terms of seat-cost per mile as well as the ability to fly directly to smaller regional airports instead of larger airports where passengers proceed to transfer flights.

The drive to cut energy-bill costs for homeowners, without cutting the performance or comfort expected from living in a new-build property, has also accelerated. The Barratt Green House aka 'zero-carbon home' is the first new home which measures up to the strict sustainability criteria the industry will have to meet by 2016.

Technology can save money in every home as well.

Take energy-saving light bulbs, for example, which supply the same level of light yet consume less electricity. Replacing all the traditional inefficient light bulbs in a three-bedroom semi-detached house could save around £45 and 170kg of CO₂ a year (or £600 and three tonnes of CO₂ for the lifetime of the bulbs). So although the price of an ordinary bulb is cheaper than a more efficient one, the savings over time more than compensate for higher initial cost.*

The uptake of these bulbs has increased since technology has improved their performance. When they were slow to deliver light and were less intense than regular bulbs, consumers were not keen to use them.

*Source: <http://www.independent.co.uk/environment/a-bright-idea-how-changing-light-bulbs-helps-beat-global-warming-and-cut-bills-406494.html>

SECTION THREE

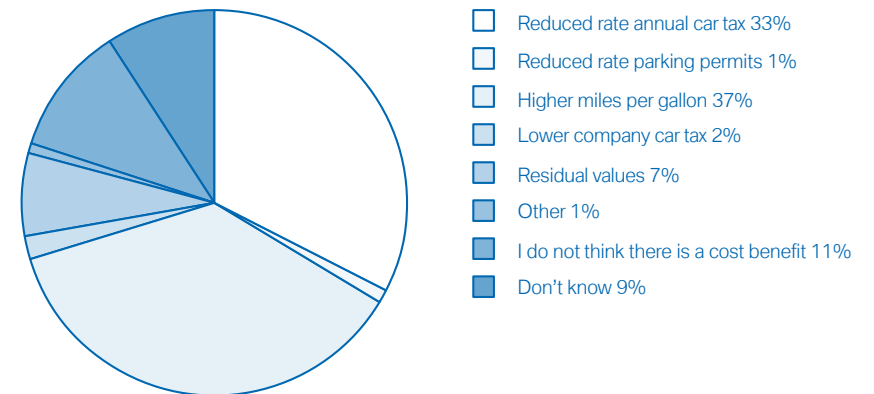
THE EVIDENCE – how cleaner technology can save money

A) Fuel efficiency

Driving Change highlights surprisingly low awareness of how more efficient driving can save money rather than add cost:

- 60% of us say cost is the most important factor when choosing a new car, which would suggest that we carefully research price and value.
- Three quarters (75%) say the biggest attraction of a more environmental car purchase would be lower bills.
- But 13% of men mistakenly believe there is no cost benefit to owning a more efficient car.

What is thought to be the main cost benefit of buying a car that is more environmentally friendly?



However, as the following statistics prove, you can combine powerful performance with low emissions and cost savings – meeting all the needs of 21st century consumers.

So just how big are the savings that can be achieved by buying a more fuel-efficient vehicle, while maintaining all the luxuries of a premium-performance car?

Take the example below comparing the BMW 118d SE 3dr Sports Hatch with rival vehicles.

Model + Version	Combined Fuel Consumption (mpg)	Annual Fuel Cost £/10,000 miles
BMW 118d SE 3dr Sports Hatch	62.8	825.50
Audi A3 2.0 TDI 140 SE	55.4	935.48
VW Golf GT Sport 2.0 TDI PD 140 DPF	51.4	1,008.28
Alfa Romeo 147 JTDm 16v Lusso	47.9	1,081.95
Ford Focus Titanium TDCi 136	51.3	1,010.24

Across the range, BMW EfficientDynamics cars achieve more miles per gallon and lower fuel costs than closest premium competitors without sacrificing performance:

Model + Version	Combined Fuel Consumption (mpg)	Annual Fuel Cost £/10,000 miles
BMW 318d SE Saloon	60.1	862.32
Audi A4 2.0 TDI SE 143	53.3	972.33
Honda Accord 09 i-DTEC EX GT	50.4	1,028.28
Mercedes C-Class C200 CDI Elegance	49.6	1,044.87

Model + Version	Combined Fuel Consumption (mpg)	Annual Fuel Cost £/10,000 miles
BMW X3 xDRIVE 2.0d SE	43.5	1,191.39
Audi Q5 TDI SE 170	42.1	1,231.01
Land Rover Freelander 2 TD4 HSE	37.7	1,374.68
Volvo XC60 D 163 SE	37.7	1,374.68

Lower emissions

More fuel efficiency and lower CO₂ emissions also equate to lower tax bills and better residual values – see below the BMW 520d SE Saloon and key competitors:

Model + Version	CO ₂	Combined Fuel Consumption (mpg)	Vehicle Excise Duty Band	Annual VED(£)	% of Value Retained if Sold After 3yrs/ 30,000 miles
BMW 520d SE Saloon	136	55.4	C	120	58
Audi A6 SE TDI	151	48.7	D	145	41
Mercedes E-Class E220 CDI Classic Saloon	160	46.3	D	145	52
Saab 9-5 Vector Sport TiD	174	44.1	E	170	38

Lower emissions and company cars

Lower emissions also have a big impact on company cars. Current approved mileage allowance payments (AMAPs) – payments made to employees to cover the expense of using their own car for business travel – are 40p a mile for the first 10,000 miles and 25p thereafter. Payments above these amounts are subject to tax and national insurance. These figures have remained unchanged since April 2002.

Benefit-in-kind calculations for company cars are based on their price and CO₂ emissions and an HMRC-evaluated benefit-in-kind percentage. So when comparing similar type cars, those with lower CO₂ emissions are taxed less:

Model	P11D Price (£)	CO ₂ emissions (g/km)	Benefit-in-kind rating (%)	Annual car tax bill if a 20% taxpayer (£)	Annual car tax bill if a 40% taxpayer (£)
BMW 520d SE Saloon	27,290	136	18	982	1,965
Volvo S80D 163	25,645	169	24	1,231	2,462
BMW 635d Coupé Auto	54,225	183	27	2,928	5,857
Jaguar XK V8	60,540	269	35	4,238	8,476

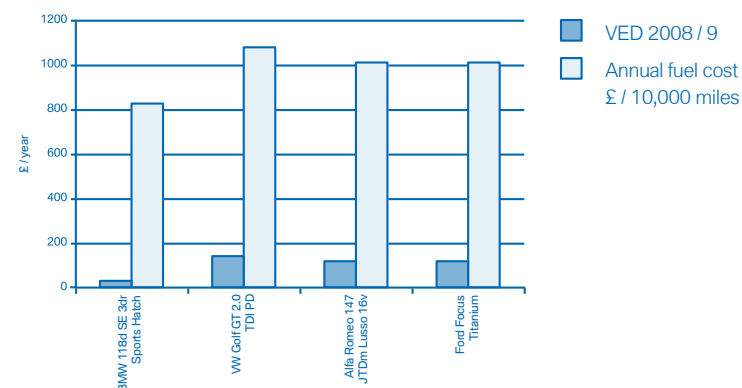
B) Tax savings

Non-company car drivers can also benefit from the new road-tax policy which comes into force from 2008 onwards.

The more generally efficient (and the lower CO₂ g/km it emits) the lower the Vehicle Excise Duty (VED), which increases based on those emissions. For example:

- A car emitting between 121-150 g/km CO₂ falls into Band C for VED and so the driver will pay £120 a year.
- Cars emitting more than 225g/km CO₂ will be taxed at £400 a year in Band G.

The table below shows Vehicle Excise Duty and annual fuel cost per 10,000 miles for the following cars:



BMW consistently offers cars in the lowest VED band within each vehicle category. For example:

- The BMW 118d SE 3dr Sports Hatch sits in Band B resulting in a VED annual cost of £35 compared to the Alfa Romeo 147 in the same category which falls into Band D and a yearly bill of £145. Obviously, this represents a significant annual saving of £110 on VED alone.
- At the other end of the spectrum, the BMW X6 xDrive30d is rated in Band F with an annual cost of £210 while other sports-activity-type vehicles including the Range Rover Sport TDV6 SE Auto, Mercedes M-Class ML 320 CDI Sport and VW's Touareg Altitude V6 TDI CR DPF cost almost 100% more at £400 in Band G.

When people were asked in the BMW/YouGov survey, in which areas they thought they could make the biggest savings when buying a greener car, results show just 7% of people think of residual values i.e. lower-emission cars holding more value (depreciating less) than cars with higher-emission levels.

Yet VED is certain to have an impact on residual values, according to EurotaxGlass, which holds data and analysis of more than half a million cars in 30 countries.

“As prices for older cars reduce over time, the tax burden comes into greater focus for prospective buyers, affecting demand and values,” comments Adrian Rushmore, EurotaxGlass’s managing editor. “Such a sharp rise in VED could well have implications for the used-car market in the coming months and years, but much will depend on customers’ understanding of the changes.”

Rushmore also reports that vehicles are already becoming characterised by above-average rates of depreciation as high polluters are usually also high consumers of fuel.

C) BMW EfficientDynamics

All these factors culminate in the class-leading BMW EfficientDynamics offering.

For over 30 years, BMW has made environmental responsibility part of its core business. In 1973, the company appointed an environmental officer – a pioneering move in the car-manufacturing world at the time. It was soon rewarded for taking a sustainable approach at its manufacturing plants: BMW has been featured in the Dow Jones Sustainability Index, a system which tracks the financial performance of leading sustainability-driven companies globally, every year since it began in 1999 – and topped it for the past four consecutive years. Officially, this makes BMW the most sustainable vehicle manufacturer.

So how can BMW claim to deliver economy and performance at the same time as not introducing a ‘halo’ environmental car? Unlike the route taken by a number of competitors, BMW has had a far more widespread impact by applying technology to make its entire standard model range more efficient.

The BMW EfficientDynamics technologies currently available include:

Auto Start-Stop - The engine is switched off whenever the car stops and is taken out of gear, restarting when the clutch is depressed.

Brake Energy Regeneration - When braking or coasting, the system engages the alternator to charge the battery, recycling energy otherwise wasted.

Electric Power Steering - When under load, the alternator disconnects to ensure the maximum engine performance is available. This reduces the drain on the engine from the usual hydraulic assistance systems.

Lightweight Engineering - Lightweight materials reduce the overall weight of the vehicle, enhancing driving dynamics and improving fuel economy.

Active Aerodynamics - Regulation of engine air intake helps the engine to reach optimum temperature more quickly, thus reducing emissions in the most important ‘warm-up’ phase.

Reduced Rolling Resistance Tyres - Heat-resistant, anti-distortion materials are used to reduce friction, therefore lowering emissions and improving fuel efficiency.

Low-friction Fluids - Reducing fluid friction in an engine helps minimise wasted energy and therefore fuel consumption and emissions.

Optimum Shift Indicator - A visual display on the car’s dashboard shows the optimum gear for the most fuel-efficient driving style.

*(While BMW EfficientDynamics technologies are fitted as standard, not every feature is applied to all models but are selected as relevant for optimum performance.)

What are some of the key elements apart from styling and quality that deliver BMW’s Ultimate Driving Machine?

Let’s take the BMW 3 Series as an example. Most cars in this class are front-wheel drive, with engines ahead of the front wheels. This means they are trying to steer and apply traction with the same wheels, automatically causing a compromise. In contrast, the BMW 3 Series has rear-wheel drive and helped by its responsive engine being positioned behind the front wheels, it has a near-perfect weight distribution of 50:50 front-to-rear. The driver is carefully positioned at the car’s centre of gravity for the most rewarding driving experience. This means that the drive is particularly responsive, agile and engaging compared to its rivals. All this plus the added reassurance of class-leading economy.

SECTION FOUR

CONCLUSIONS

A) Cleaner energy driving change

With 450,000 models incorporating EfficientDynamics technology sold in Europe in 2007 and 830,000 estimated in 2008, BMW estimates its customers have saved 150 million litres of fuel and cut CO₂ emissions by 373,000 tonnes*.

Following independent, industry-wide research into CO₂ emissions, BMW Group products are also officially the cleanest premium cars. The data compiled (www.cleangreencars.co.uk) shows that, through its EfficientDynamics programme, the BMW brand has the most improved average CO₂ emissions of any premium manufacturer.

“No other manufacturer has reduced its average CO₂ output by as much as BMW over the last couple of years,” says Jay Nagley of Clean Green Cars.

“Economic and environmental benefits are opposite sides of the same coin. Cutting CO₂ means cutting fuel consumption – they are just different ways of expressing the same process.”

In fact across one weekend BMW Dealers recommended efficiencies on existing cars which delivered 1 million miles-worth of fuel saving. (See Appendix for more detail.)

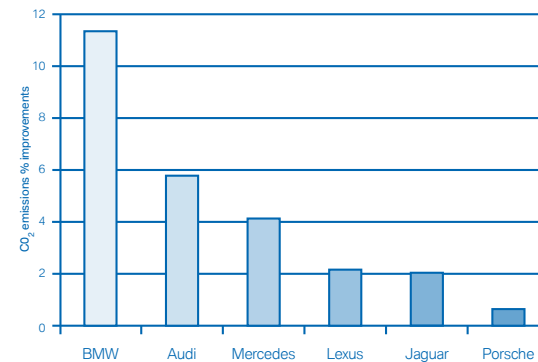
A report** into average total model range emissions for car manufacturers found that from the period January 2008 to June 2008, BMW recorded an average of 161.64g/km. By comparison the model range averages for Audi and Mercedes were 177.36g/km and 192.85g/km respectively. Even Lexus with its high proportion of current hybrid sales model line-up only managed an average of 194.85g/km, while Jaguar topped 200g/km and Porsche recorded 275.64g/km.

It's a similar BMW success story when looking at the percentage improvements for premium manufacturers over the same time frame.

*Source: BMW Magazine

**Source: Society of Motor Manufacturers and Traders

Percentage that premium car manufacturers have improved average CO₂ emissions, Jan - June 2008



BMW has improved its average emissions by 11.34%

Audi 5.78%

Mercedes 4.13%

Lexus 2.16%

Jaguar 2.04%

Porsche 0.63%

In fact, the total impact of BMW Group accounted for 50% of total industry emission reductions 2006-2007.

The UK is the leading hybrid market in Europe but the degree of faith placed in current hybrid cars may be misplaced. While they are energy efficient, and can deliver low emissions and good economy in cities, in real-world driving, an efficient diesel may in fact travel more miles on one tank of fuel than current hybrids. More advanced hybrid solutions are in the pipeline and will be included under the BMW EfficientDynamics banner. However, unlike the current generation of hybrid, these will deliver greater performance and economy benefits.

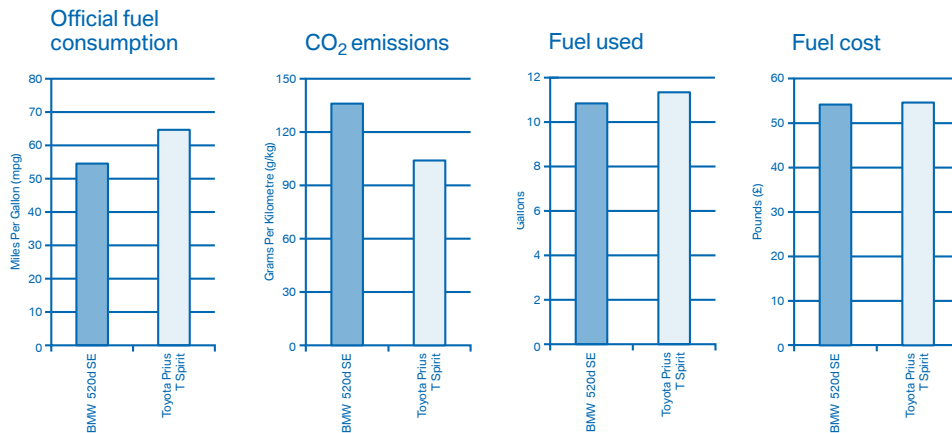
Even without hybrid, official fuel-consumption figures show that a BMW 318d Saloon is more economical than a Toyota Prius petrol-electric hybrid when outside an urban environment:

Toyota Prius (petrol/electric engine): Fuel economy, extra urban: 67.3mpg

BMW 318d (diesel engine): Fuel economy, extra urban: 68.9mpg

Diesels are generally more economical than petrol engines, so advice about the most efficient cars depends on how the car will be used – very few cars are only used in urban environments.

To prove this still further, a BMW 520d was tested against the Toyota Prius for fuel consumption by correspondents from The Sunday Times In Gear section in a drive from London to Geneva. It showed that even the larger diesel-engined BMW 5 Series was more economical than a Prius hybrid on longer journeys.*



Model: BMW 520d SE. Official fuel/CO₂: 55.4mpg / 136g/km, fuel used on test: 10.84 gallons (50.3mpg), fuel cost: £54.19 (diesel)

Model: Toyota Prius T Spirit. Official fuel/CO₂: 65.7mpg / 104g/km, fuel used on test: 11.34 gallons (48.1mpg), fuel cost: £54.64 (petrol)

Obviously, this is not a static situation: different cars will suit different journeys and technology is constantly evolving. This presents the initial phase of BMW EfficientDynamics as the best solution to the average journey in the short term with progressions to come.

B) Premium performance

So if a car is really economical, can it offer premium performance? These statistics speak for themselves:

Average mpg: 58.9
 Out of town mpg: 68.9
 Urban mpg: 47.1
 128g/km CO₂
 175hp
 143mph
 0-62 mph in 7.9 seconds.

*Source: http://driving.timesonline.co.uk/tol/life_and_style/driving/used_car_reviews/article3552994.ece

The public's perception is that there cannot be a car that can achieve almost 70mpg, yet is capable of a top speed of more than 140mph. Not so, and that car is not a small eco-car two-seater, it's the BMW 320d Saloon. So premium cars can be economical while still delivering an engaging, premium driving experience.

C) Close

As Driving Change has revealed, the economic pressures and environmental concerns of the 21st century are certainly having an impact then, both on individual consumer choice and also on industry. While drivers are increasingly concerned about finance, the cost savings associated with fuel efficiency are becoming more and more important, and now taking priority over the environmental benefits of lower emission cars. Yet cleaner energy is still important in the decision-making process. And alongside this, consumers have come to expect a level of quality, experience and performance which they simply will not compromise on.

Hence a challenge for industry – car manufacturers need to provide premium vehicles which are not only environmentally friendly and cost efficient but which also deliver excellence in driving performance.

Driving Change has demonstrated that BMW EfficientDynamics has achieved this and independent awards recognize these technological advances. Both WhatCar? and Car magazines gave the company Green awards, while 47 journalists from 24 countries voted BMW 118d the World Green Car of the Year at the New York International Auto Show in 2008.

BMW EfficientDynamics is using advanced technology to deliver a major impact on economy whilst providing class-leading performance for the individual driver.

So, in conclusion, whilst differences are evident between regions, ages and gender, one common thought is clear: people are not willing to make sacrifices or compromise in performance, cost or image for the sake of the environment. They may be open to supporting efficiency, but the key factor in their decision resolves around their personal benefit, their economic savings and their reassurance of a dynamic driving experience.

APPENDIX

To understand how to save money through more efficient motoring, drivers of all cars registered after the year 2000 were invited to have their vehicles checked during BMW's EfficientDynamics Open Weekend in May this year. A simple efficiency check involved tyre pressures (under /over pressure by how much – in bar); whether aircon was off or on; extra weight in the boot and/or luggage compartment; and the presence of external extras such as bike carriers or roof racks, as detailed below.

Advice provided at BMW EfficientDynamics weekend:

BMW Efficiency Check

Customer name:	Mr. Jack Andrews	Current Car efficiency	
Car:	Audi A3 TDI SE	Overall fuel consumption	50.40 mpg
Registration no.:	AA55BBB	Annual fuel cost	£2,056.56
Annual mileage:	20000	Calculated Annual Fuel cost	£2,150.57
		You have saved	£94.01




Additional weight

We identified the following items in your car that add extra weight. Look to remove these items where feasible during day-to-day driving to improve your car's fuel efficiency.

- Documents and laptop


Using a standard index we estimate that these items total 15 kg of additional weight. Removing these items contributes to the efficiency savings indicated above.



Air conditioning

Air conditioning can increase fuel consumption by as much as 10%. Even though we recommend the reduction in the use of air conditioning to improve fuel consumption, please remember that it is important to run the system through occasionally to keep the system in good working order.


- We noted that the air-conditioning was on. We have checked your microfilter to ensure that your air-conditioning system remains in good working order.



Cooling system


We checked the coolant level in your vehicle. The cooling system is designed to keep the engine at an optimal temperature. Running at too low or too high a level causes emissions to increase and fuel efficiency to reduce.

- We found that your coolant level requires topping up and our Technician has completed this. Please check the levels every six months or so to maintain maximum fuel efficiency.



External accessories


You don't have a roof rack fitted, but if you did this increases drag significantly. This impact is particularly prevalent at higher speeds and has the combined impact of reduced fuel efficiency and increased CO2 emissions.



Oil level

One in four motorists' vehicles has oil levels below the vehicle manufacturer's recommended limits. Clean oil also contributes to better fuel efficiency. BMW recommends that the engine oil in their cars is changed between every 10,000 to 14,000 miles depending on the age and vehicle usage. Please ask for more details.

Your oil level was below the minimum recommended levels and we have topped it up to ensure that you leave us with your car operating at optimum efficiency.



Tyre pressures

The table below summarises the condition of your tyres. Under-inflated tyres have a big impact on the fuel efficiency and handling of your vehicle.

	Front	Back	Spare
Recommended	2.1	2.0	2.1
Off-side	2.1	1.9	n/a
Near-side	2.1	1.9	n/a
Spare	n/a	n/a	n/a

- two out of four tyres were under-inflated. We have inflated them to the correct pressure to ensure that fuel efficiency is optimised.



 All data is sourced from a 3rd-party, independent industry source (EMMOX Carcost Ltd.) on a monthly basis. All data shown is valid until the end of October 2008

For interest, details of comparable cars were also given:



BMW Efficiency Check

Compare your car	BMW 1 Series Sports Hatch 118d SE	Audi A3 TDI SE *
Performance		
Max Speed (mph)	130	129
Max Power (hp)	143	138
0-62 mph (secs)	8.9	9.5
Efficiency		
CO2 emissions (g/km)	119	150
Fuel Consumption Combined (mpg)	62.8	50.4
Carbon Footprint Kg/Yr	3,832	4,830
Cost		
On the road price	£20,475	£19,887
Vehicle excise duty (VED)	£35	£120
Vehicle excise duty band	B	C
Insurance group	11	11
Annual fuel costs	£1,650.49	£2,056.56
BK tax rating 2008 - 2009	13%	18%
Annual company car tax	20% = £530 40% = £1,060	20% = £749 40% = £1,498

* Figures for your current car are according to manufacturer's figures at time of manufacture. Shaded area indicates leading performance.

BMW 1 Series Sports Hatch 118d SE

BMW EfficientDynamics
Less emissions. More driving pleasure.



BMW EfficientDynamics technologies currently present on this model:



All data is sourced from a 3rd-party, independent industry source (EMMOX Carcost Ltd.) on a monthly basis.
All data shown is valid until the end of October 2008

All BMWs can be considered against their competitors through an independent comparison tool on www.bmw.co.uk.

BMW
EfficientDynamics

[www.bmw.co.uk/
efficientdynamics](http://www.bmw.co.uk/efficientdynamics)



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