




# THE UK AUTOMOTIVE SECTOR SUSTAINABILITY REPORT



## PRODUCTION , USE AND DISPOSAL EIGHTH INDUSTRY REPORT



# CONTENTS

<b>1.0 Signatories and the reporting year</b> 3	<b>2.0 Executive summary</b> 7	<b>3.0 Life cycle overview</b> 13
<b>4.0 Vehicle production and distribution</b> 15 	<b>5.0 Vehicle use</b> 23 	<b>6.0 Vehicle disposal</b> 33 
4.1 UK production and registration 16 4.2 Economics and investment 17 4.3 Production inputs 18 4.4 Material outputs 19 4.5 People and skills resource 20 4.6 Supply chain 22	5.1 Introduction 24 5.2 CO <sub>2</sub> 25 5.3 Alternative fuels 28 5.4 Air quality 29 5.5 Safety 32	6.1 End of life vehicles 34
<b>7.0 Stakeholder engagement</b> 37	<b>8.0 Integrated approach</b> 39	<b>Appendices</b> 44 <b>References</b> 47 <b>Contact information</b> 48

# 1.0 Signatories and the reporting year



# 1.0 Signatories and the reporting year

This is the eighth annual report produced by the SMMT on the sustainability of the automotive sector. Now is a very pertinent time to look at the ongoing sustainability of the UK vehicle industry.

2006 was a great year of change in the UK automotive sector. Plant closures in Coventry and model changes elsewhere affected production volumes. However a successful UK automotive sector is still extremely viable.

A rapidly evolving, environmentally focused industry needs to deliver all the elements of sustainability to ensure long-term viability. This report demonstrates the challenges we face in the UK of achieving this and is a reflection of the pressures of adapting procedures, methods, products and disposal of vehicles. We have success in some areas, but not in all.

I hope you enjoy the new report and we look forward to SMMT coverage of these issues in future years.



Christopher MacGowan

Chief Executive, SMMT



**Signatories to this report are:**

Bentley Motors

BMW Group

\*Daimler Chrysler

Ford Motor Company

GKN Driveline Limited

Honda UK Manufacturing Limited

IBC Vehicles Limited

Jaguar Cars Limited

Land Rover

LDV

Nissan Motor Manufacturing (UK) Limited and Nissan  
Technology Centre Group

\*Perkins Engines

PSA Peugeot Citroën Automobiles UK Limited

Toyota (GB) plc and Toyota Motor Manufacturing UK Limited

Vauxhall Motors Limited

Volvo Cars UK Limited

Volkswagen Group (UK) Limited

**Brands:**

Bentley

BMW, MINI

Mercedes Benz, Smart, Chrysler

Ford engines, Ford Transit Vans

GKN

Honda

Vauxhall, Nissan and Renault Vans

Jaguar

Land Rover

LDV Vans

Nissan

Perkins

Peugeot, Citroen

Toyota, Lexus

Vauxhall

Volvo

Audi, SEAT, Skoda, Volkswagen Passenger Cars,  
Volkswagen Commercial Vehicles

\* Not included in 2005 data. Perkins manufactures engines, Daimler Chrysler data represents UK sales, administration and logistics.

Number of signatories has changed as a result of referring to groups not brands in 2006.

### Vehicle production

- Production and real investment decline in 2006
- Plant closures and re-assignments
- Employment in manufacturing declines
- Overall environmental performance stable
- Waste disposal issues caused by regulatory change

### Vehicle use

- Air quality improvements
- Vehicle safety improvements
- CO<sub>2</sub> product performance improves
- Total car CO<sub>2</sub> emissions fall, despite increases in vehicle numbers and distance driven

### Vehicle disposal

- Car "take back" schemes in place
- Data collection systems to be reviewed

### Integrated approach

- Technology
- Removing barriers to change
- Carbon price

An approach to all three is required to reduce CO<sub>2</sub> emissions from road transport.

## 2.0 Executive summary



## 2.0 Executive summary

### 2.1 Production and distribution

The following section outlines the updated commitments developed in response to changes in our business and responsibilities.

Performance of the sector in relation to the updated commitments is highlighted at the front of each section.





• **Green implies progress**, **orange static or too early to quantify** and **red, concern**.

		2002	2003	2004	2005	2006
Number of signatories	(AS)	24	22	20	20	*17

This year two additional signatories (Daimler Chrysler, Perkins) were included into our report.

\* Please note that number of signatories has changed as a result of referring to groups not brands in 2006.

#### 2.1.1 Vehicle production and distribution

		2002	2003	2004	2005	2006	CHANGE 2006 ON 2005	REPRESENTATION
Production inputs								
Total combined energy use	(gwh) (AS)	6,681	6,126	5,337	5,103	4,851	-252	
Energy used per vehicle produced	W/h/unit) (VMS)	4.0	2.8	2.5	2.3	2.5	0.2	
Total combined water use	(000m <sup>3</sup> ) (AS)	9,108	8,404	7,037	7,127	6,779	-348	
Water use per vehicle produced	(M3/unit) (VMS)	5.6	3.4	3.4	3.2	3.3	0.1	

#### SUMMARY

In the context of the whole industry the overall energy and water use continue to fall. The closure of the Ryton plant and production changes elsewhere have contributed to the loss of production volume, causing an increase in the per vehicle figure.

#### COMMITMENT







Control and reduce the environmental impact of company operations.

#### FUTURE

More efficient use of the resources, trends dependant on manufacturing production levels.



## 2.1.2 Material outputs

		2002	2003	2004	2005	2006	CHANGE 2006 ON 2005	REPRESENTATION
Total combined CO <sub>2</sub> equivalents	(tonnes) (AS)	2,142,706	1,679,832	1,447,900	1,417,129	1,363,189	-53,940	
CO <sub>2</sub> equivalents per vehicle produced	(tonnes/unit) (VMS)	1.2	0.7	0.7	0.6	0.7	0.1	
Total combined emissions of VOCs	(tonnes) (AS)	6,240	7,337	5,480	6,478	5,041	-1,437	
VOC emissions per vehicle produced	(kg/unit) (VMS)	4.2	4.10	3.50	3.50	2.9	-0.6	
Total combined waste to landfill	(tonnes) (AS)	70,897	56,743	52,842	44,910	39,862	-5,048	
Waste to landfill per vehicle produced	(kg/unit) (VMS)	40.5	17.90	19.80	14.50	17.00	2.5	

### SUMMARY

The overall material output was considerably lower last year. A slight increase in CO<sub>2</sub> and waste to landfill per vehicle related to production decrease, as well as plant closure. Change in the definition of waste paint sludge increased waste to landfill.






### COMMITMENT

Improve our understanding of the impact of pre- and post- production logistics towards the environment.

### FUTURE

Increased use of renewables and green energy, alongside aiming to achieve zero by-products from manufacturing. Availability, classification and cost of waste outlets will impact capability to move toward zero waste.

## 2.1.3 Economics and investment

		2002	2003	2004	2005	2006	CHANGE 2006 ON 2005	REPRESENTATION
Automotive manufacturing sector turnover	(£ billion)	43.1	46.00	46.20	47.60	48.50	0.9	
Total number of cars and CVs produced	(UK) (WI) (million)	1.82	1.84	1.86	1.80	1.65	-0.2	
Total new car registrations	(UK) (AC) (million)	2.56	2.58	2.57	2.44	2.34	-0.1	
<b>Signatories' combined turnover</b>	(£ billion) (AS)	35.70	39.16	34.64	39.38	41.87	2.5	
Total number of vehicles produced	(AS) (million)	1.44	1.73	1.61	1.77	1.90	0.1	

### SUMMARY

Further decline in production and registration. Linked with plant closures and increased interest rates, resulting in decline in demand. Changes in model development reduces output in 2006.





### COMMITMENT

Affirm economic growth, turnover and investment toward securing competitiveness in the global economy.

### FUTURE

Concern over future investments to sustain UK production levels.

## 2.1.4 Employment and employees

		2002	2003	2004	2005	2006	CHANGE 2006 ON 2005 REPRESENTATION	
Signatories' combined number of emp	(AS)	89,455	87,625	76,327	72,337	75,789	3,452	
Signatories' lost-time incidents	(AS)	648	710	491	410	385	-25	
Signatories' average number of traini	(AS)	4.2	3.8	2.9	3.2	2.7	-0.5	
Signatories' average staff turnover	(%) (AS)	7.0	7.1	8.65	5.8	5.7	-0.1	

### SUMMARY

Although the number of employees is up, this is due to inclusion of new signatories; like for like employment continues to fall.


### COMMITMENT

Add value to employment capital through development, skills and training.  
Improve the working environment, health and safety of employees.

### FUTURE

Cooperation with the government to ensure that a more skilled and satisfied workforce is in place.

## 2.2 Vehicle use

		2002	2003	2004	2005	2006	CHANGE 2006 ON 2005 REPRESENTATION	
Average new car CO <sub>2</sub> emimissions	(g/km) (AC)	174.2	172.1	171.4	169.4	167.2	-2.2	

### SUMMARY

In recent years, successful introduction of more environmentally friendly models into the market resulted in lowering national CO<sub>2</sub> emissions from new registrations. Decline in total CO<sub>2</sub> emission from cars. Significant improvements in safety and air quality emissions.

### COMMITMENT

Improve fuel efficiency of new product design.  
Improve the safety of the product.

### FUTURE

Providing consumers with a wide choice of safer, cleaner and affordable vehicles complying with higher emission standards.

## 2.3 End-of-life vehicles

### COMMITMENT






Provide facilities for consumers to reduce vehicles for disposal at the end of life.

Design and make cars so that at least 95 per cent of the weight of materials used can be recovered at the end of life.

### FUTURE

To continue to design vehicles for recycling, to research recyclability of lightweight and composite vehicles and components together with an increase of total recycling levels.

## 2.4 Sector fact sheet




		2002	2003	2004	2005	2006	CHANGE 2006 ON 2005	REPRESENTATION
Automotive manufacturing sector turnover	(WI) (£ billion)	44.6	46.0	46.2	47.6	48.5	0.9	
Total net capital investment	(WI) (£ billion)	1.3	1.2	1.1	1.3	1.4	0.1	
Value of exports	(WI) (£ billion)	20.9	21.9	22.5	23.7	24.5	0.8	
UK sector share of global passenger car production	(%)	3.9	3.9	3.7	3.5	3.4	-0.1	
Number of cars and CVs produced	(million)	1.8	1.9	1.86	1.8	1.7	-0.1	

### SUMMARY

Motor manufacturers maintain their leading role as value producers and exporters in the UK economy. Production and real investment declines.

### FUTURE

Industry relying on smaller number of plants strongly linked with export market.

Data in the report is quoted in a number of ways:		Out of 25 key indicators	
Whole industry data	(WI)		16 green, progress
All car sales in the United Kingdom	(AC)		0 amber, static
SMMT members data	(SMMT)		9 red, concern
All signatories	(AS)		
Vehicle manufacturing signatories	(VMS)		

### 2.4.1 Worldwide car production (‘000 units)

	2002	2003	2004	2005	2006	2006 ranking	CHANGE 2006 ON 2005 - REPRESENTATION
<b>Japan</b>	8,619	8,478	8,720	9,017	9,757	1	740
<b>Germany</b>	5,123	5,145	5,192	5,350	5,399	2	49
<b>China</b>	1,091	2,019	2,316	3,931	5,233	3	1,302
<b>USA</b>	5,019	4,510	4,230	4,321	4,366	4	45
<b>Korea Republic</b>	2,651	2,768	3,123	3,357	3,489	5	132
<b>France</b>	3,283	3,220	3,227	3,113	2,728	6	-385
<b>Brazil</b>	1,520	1,505	1,863	2,010	2,092	7	82
<b>Spain</b>	2,267	2,399	2,403	2,098	2,079	8	-19
<b>India</b>	706	908	1,178	1,264	1,472	9	208
<b>United Kingdom</b>	1,630	1,658	1,647	1,596	1,442	10	-154
<b>Total countries shown</b>	<b>31,909</b>	<b>32,610</b>	<b>33,899</b>	<b>36,057</b>	<b>38,057</b>		
Others	10,357	10,397	11,411	11,992	13,038		
<b>Grand total</b>	<b>42,266</b>	<b>43,007</b>	<b>45,310</b>	<b>48,049</b>	<b>51,095</b>		

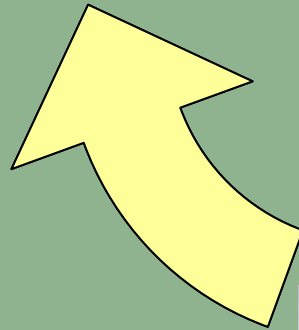
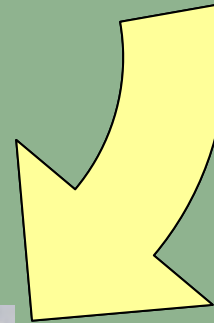
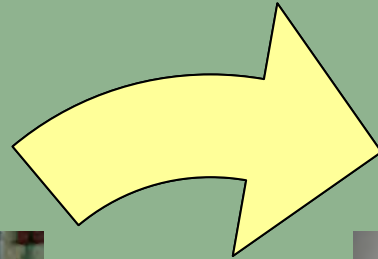
#### SUMMARY

During the last five years total production from the top ten manufacturing nations as at 2006, increased from 31,909,000 to 38,057,000 units. Production patterns have moved from Europe and North America to the Far East, East and South America.

#### FUTURE

Growing production in the Far East and South America with increasingly competitive product portfolio, initially for home production, but developing export potential.

# 3.0 Life cycle overview



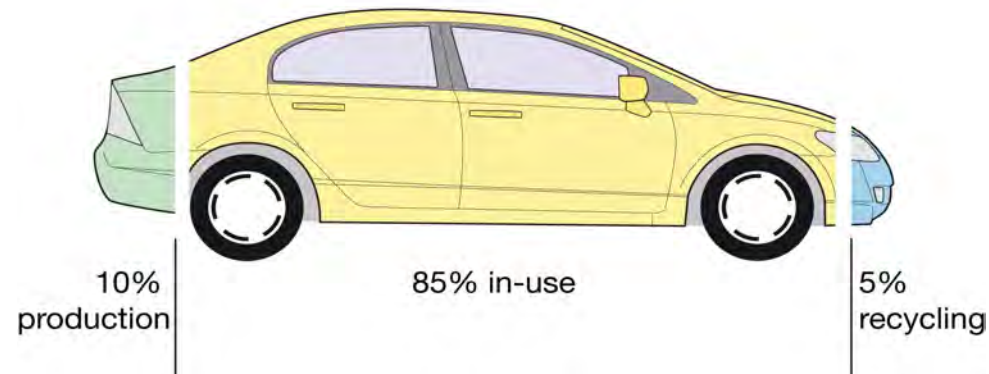
# 3.0 Life cycle overview

Evaluating the environmental attributes of a product requires looking at all stages of a product's life cycle. Observing the complete life cycle from production to use and disposal of a product helps obtain a clearer and more complete picture of the product's environmental attributes.

We have identified the emission of CO<sub>2</sub> and projected implications for the life cycle of a car. Other vehicle types and other emissions will have a different cycle overview. We are able to illustrate the relative importance of the use phase on CO<sub>2</sub> emissions from cars.

This is a CO<sub>2</sub> overview, other sustainability indicators, safety, air quality and noise will demonstrate different values throughout the life cycle.

The breakdown of CO<sub>2</sub> life cycle emissions here is based on our own data and a range of academic reports<sup>(1) (2) (3)</sup>



### Production and distribution:

- Production
- Logistics
- Energy for sales and support functions

### Use phase:

- CO<sub>2</sub> from distance driven
- CO<sub>2</sub> from servicing and after market functions

### Disposal:

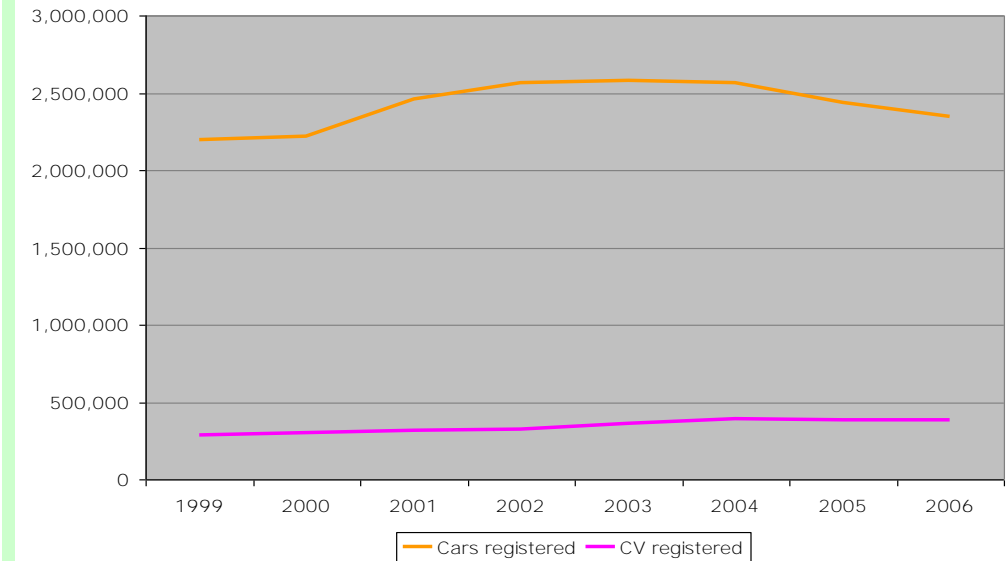
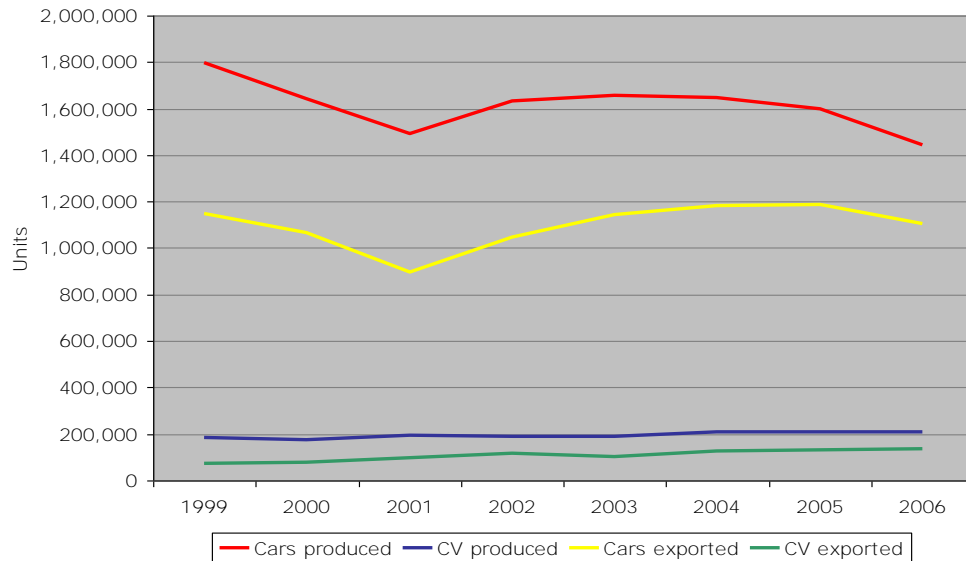
- CO<sub>2</sub> from end-of-life (ELV) operations
- \* Note; if scrap is used in remanufacturing this item can become negative since scrap often saves energy over the use of virgin materials.

## 4.0 Vehicle production and distribution



## 4.0 Vehicle production and distribution

### 4.1 UK production and registration



Source: SMMT

Source: SMMT

#### Production

Production fell in 2006, primarily due to the closure at Peugeot Ryton and model changeovers. Ryton will not be replaced, so UK production is reliant on increase from current plants. These plants are highly export dependent (76.7 per cent), highlighting the need to ensure free, equitable trade is retained.

#### Registration

After four years of high levels of car registrations, there was a decline in 2006. Private buyer confidence may account for the decline in market activity, but the loss of 95,000 units is significant. Commercial vehicle registrations increased in 2006, a sign of buoyant economic activity. The introduction of new emissions regulations created a market distortion in the commercial sector.

#### Export

The level of exported cars and CVs has a direct bearing on production volume. Despite a decline in car production, the UK is still one of the major players in the European market.



## 4.2 Economics and investment

**Table 4.2.1**

		1999	2000	2001	2002	2003	2004	2005	2006
Auto manufacturing sector net capital	(£ billion)	2.2	2.2	2.2	1.3	1.2	1.4	1.3	1.4
Inward direct investment into automotive	(£ billion)	3.3	2.6	-0.9	-4.4	-3.3	-0.7	0.6	0.3

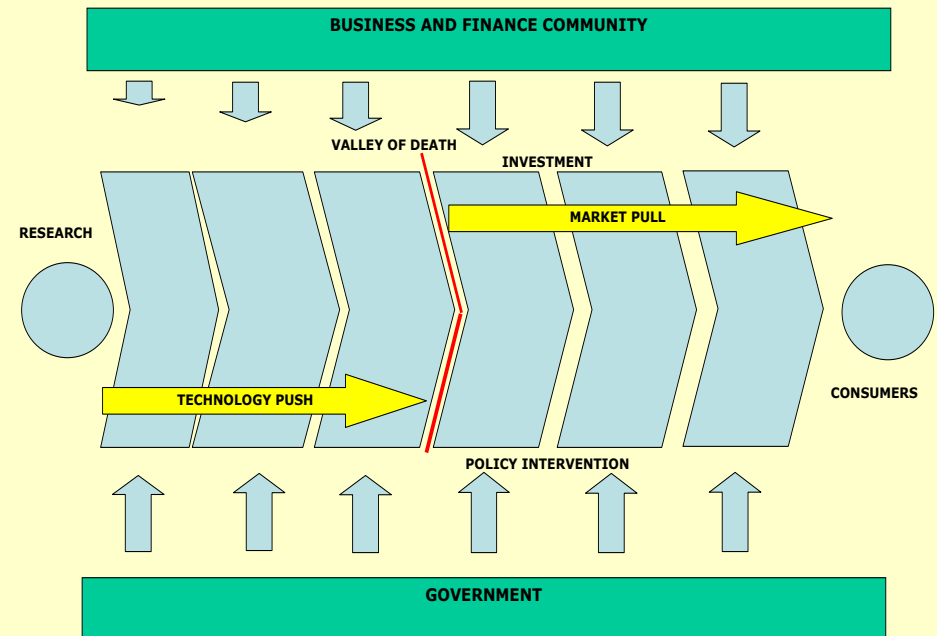
Investment in the sector continues to decline in real terms. This is of concern for the long-term sustainability of the automotive sector in the UK. In a global investment scenario, although remaining a significant market and exporter, the UK is not maintaining its profile of investment.

Support for investment through coordinated work by the Department for Transport and BERR (formally DTI) will be required to develop new technologies and reverse this trend.

Investment in new technology is critical to ensure future sustainable transport. Transport, however, is a complicated balance of supply of new innovative products and demand for these products. Stern (October 2006) recognised this in his market transformation model. Supply, technology push and demand, and market pull, are all required to transform the marketplace. <sup>(4)</sup>

Many new technologies fail to achieve commercial production volumes after research and testing. This is the so-called "valley of death" to commercialisation and sale in significant volumes.

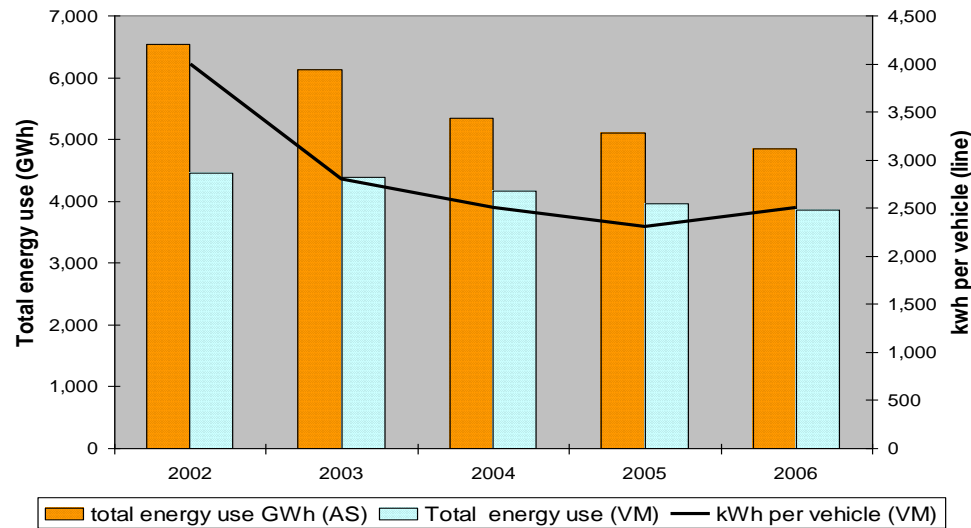
Overcoming the "valley of death", the bridge between new technology supply and roll up demand, is critical to the success of sustainable transport. To take new products from research to popular consumer demand, support from government and business finance is needed throughout the process.



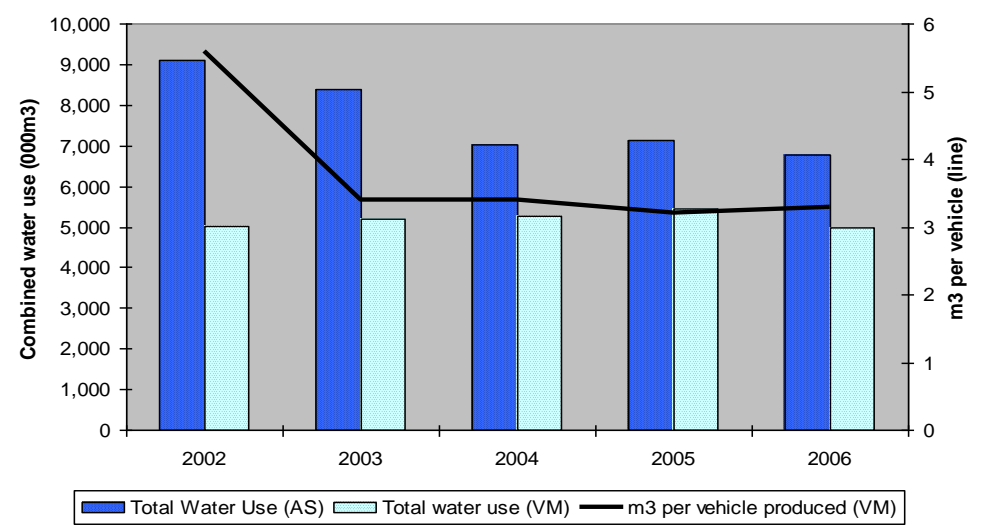
Source: Stern Report

## 4.3 Production inputs

### 4.3.1 Energy consumption



### 4.3.2 Water use



#### Total energy use - all signatories (AS)

Total energy use fell in absolute terms, by five per cent, despite the addition of Perkins and Daimler Chrysler's field-based operations to the data. Two signatories now use renewable power generators on site.

#### Energy use - vehicle manufacturers (VM)

Energy use for all vehicle manufacturers remained about the same in 2006.

#### Energy use per vehicle (VM)

This indicator rose in 2006 by nine per cent. Decline in production levels associated with the closure of Peugeot Ryton and model changes led to reduced production values and this led to a relative increase in energy use per vehicle.

#### Total water use - all signatories (AS)

Total water use was much lower in 2006 across the sector, falling by five per cent.

#### Water use - vehicle manufacturers (VM)

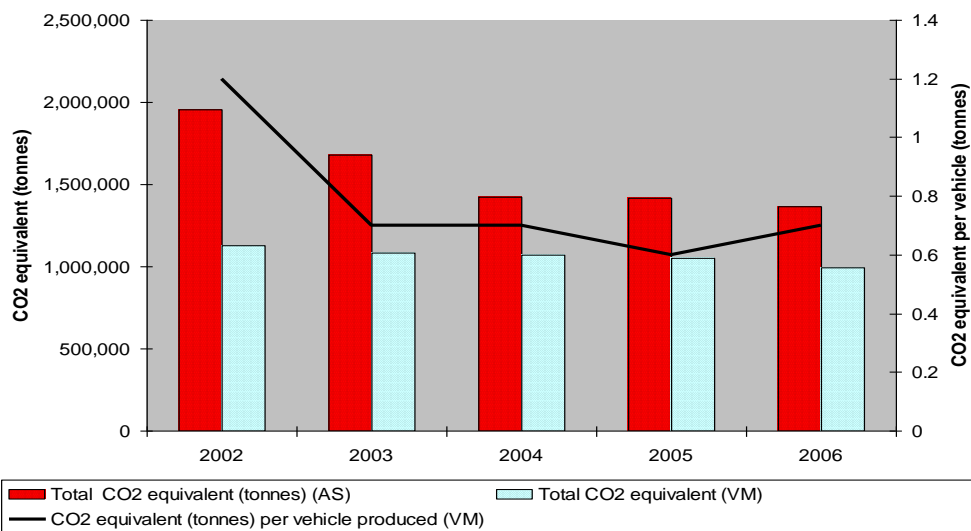
Less water used in 2006 when compared to 2005.

#### Water use per vehicle (VM)

Last year we can observe a slight increase in water use per vehicle. This is as a result of the decline in production levels.

## 4.4 Material outputs

### 4.4.1 CO<sub>2</sub> emissions from production and distribution



#### Total CO<sub>2</sub> emissions - all signatories (AS)

In 2006 CO<sub>2</sub> emissions from manufacturing, distribution and sales declined in absolute terms, despite two additional signatories.

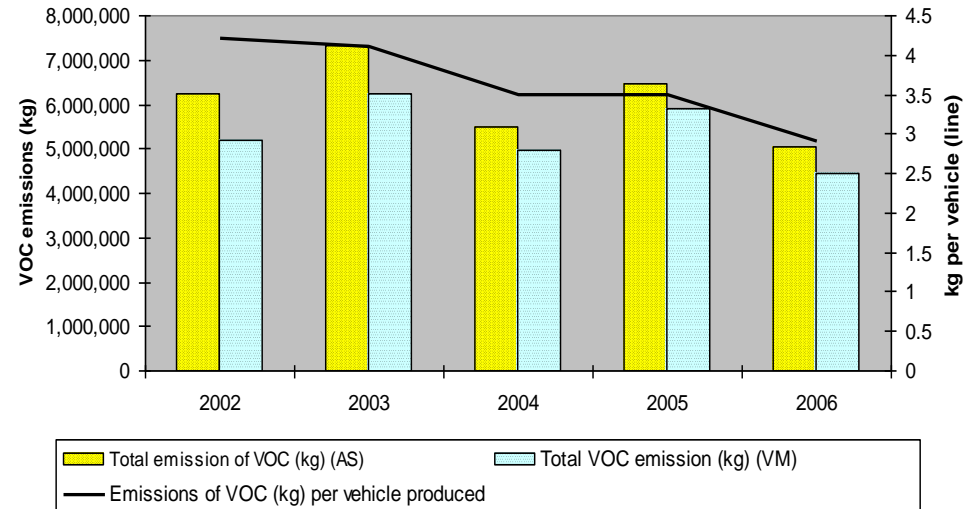
#### Total CO<sub>2</sub> use - vehicle manufacturers (VM)

There was a slight decrease in overall CO<sub>2</sub> emissions from UK vehicle manufacturers' production.

#### CO<sub>2</sub> emissions per vehicle produced

There was an increase in CO<sub>2</sub> emissions per vehicle by 0.1 tonnes in comparison with 2005. This fact is strongly connected with the lower number of vehicles produced in 2006.

### 4.4.2 Volatile organic compound (VOC) emissions



#### Total VOC use - all signatories (AS)

After increasing in 2005, total VOC value significantly declined in 2006, by 22 per cent.

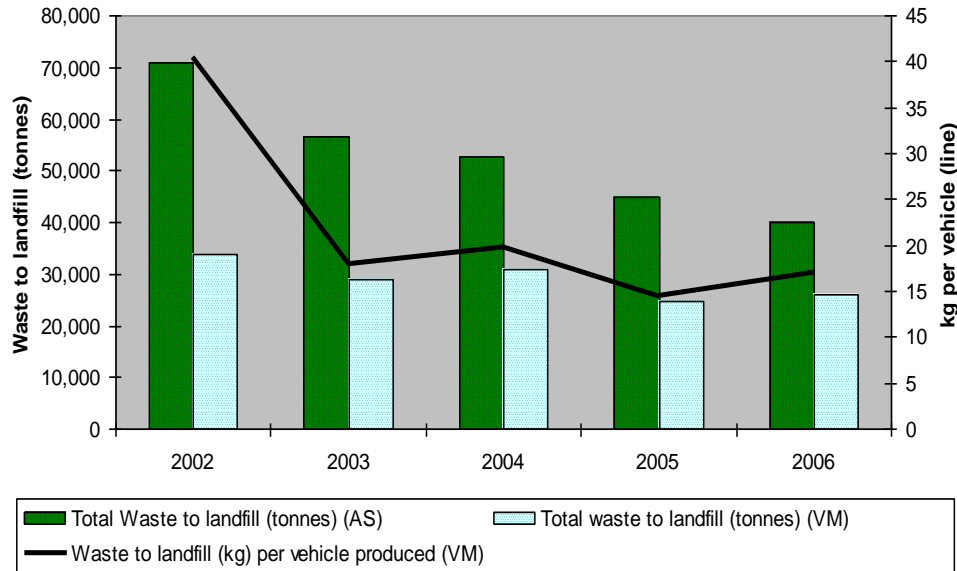
#### Total VOC use - vehicle manufacturers (VM)

VOC emissions dropped down to the lowest value recorded to date.

#### Emission of VOC per vehicle produced

After stability in 2005, emissions of VOCs declined significantly by 17 per cent from 3.5 kg per vehicle in 2005, to 2.9 kg per vehicle in 2006. This is consistent with continuing investment in paint shop facilities in the industry.

### 4.4.3 Waste to landfill



#### Total waste to landfill - all signatories (AS)

Declined slightly in 2006. The closure of Peugeot Ryton generated demolition waste which affected this figure.

#### Total waste to landfill - vehicle manufacturers (VM)

Increased slightly by five per cent in 2006 to 25,930 tonnes from 24,654 tonnes in 2005.

#### Waste to landfill per vehicle produced

Increased by 2.5 kg per vehicle equivalent. This was due to statutory changes in the definition of waste (paint sludge) and the reduced availability to utilise other materials in cement production, which then went for disposal. <sup>(5)</sup>

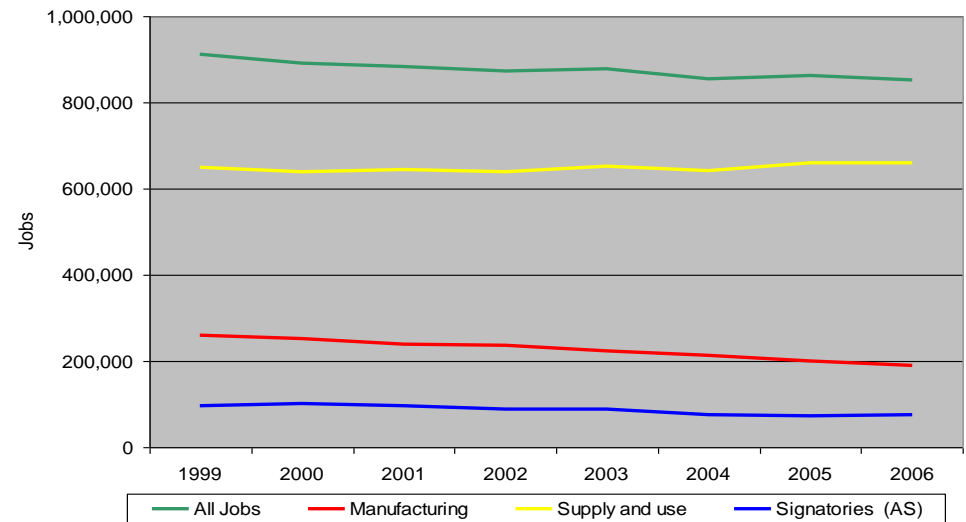
## 4.5 People and skills resource

### 4.5.1 Employment

2006 saw a further decline in employment in manufacturing and for signatories (excluding Perkins and Daimler Chrysler, who are not included in last year's data).

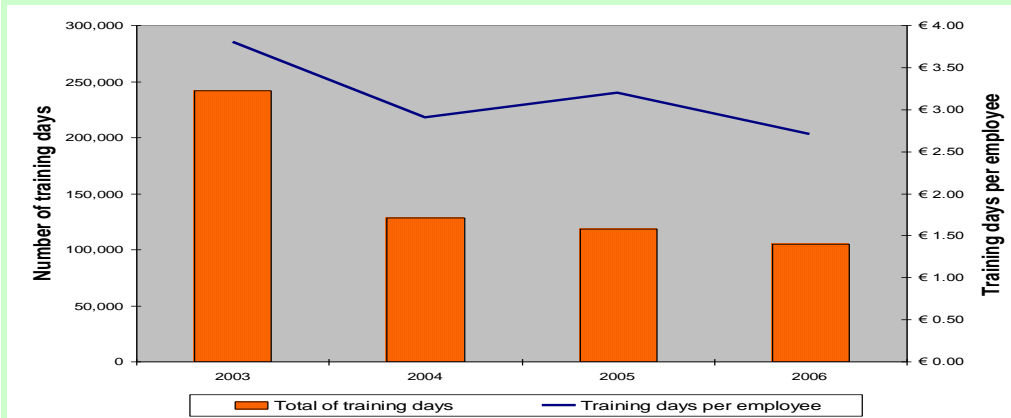
In 2006 we started to analyse employment by signatories. Of 75,000 employees we would estimate 70 per cent are directly manufacturing related. The remaining are functions such as sales and marketing, finance and logistics.

Declining employment levels remain a concern for the UK as a manufacturing base.



Source: SMMT

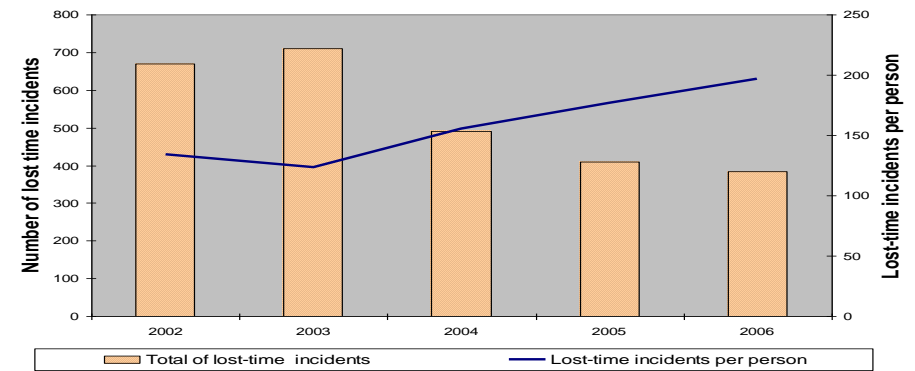
## 4.5.2 Training



Training by the signatories is about three days per employee per year, indicating an investment of about 225,000 days per annum. Actual days declined slightly in 2006 from 3.2 to 2.7. Reduced investment in training is of concern.

Training links directly to the skills base and it is encouraging to see the development of a higher skills base in the sector. We are concerned that skills shortages may become a barrier to further development of the sector.

## 4.5.3 Health and safety



Health and Safety incidents continue to make further reduction and has declined by 300 incidents since 2002.

This has been helped by establishing a best practice working group, sharing the benefits of best safety procedures amongst manufacturers.

However as employee numbers decline, ratio per employee has increased.

Many automotive manufacturers promote improvements in education, training and learning.

A prime example of this tendency is one of our signatories which brought in many new training initiatives during 2006.

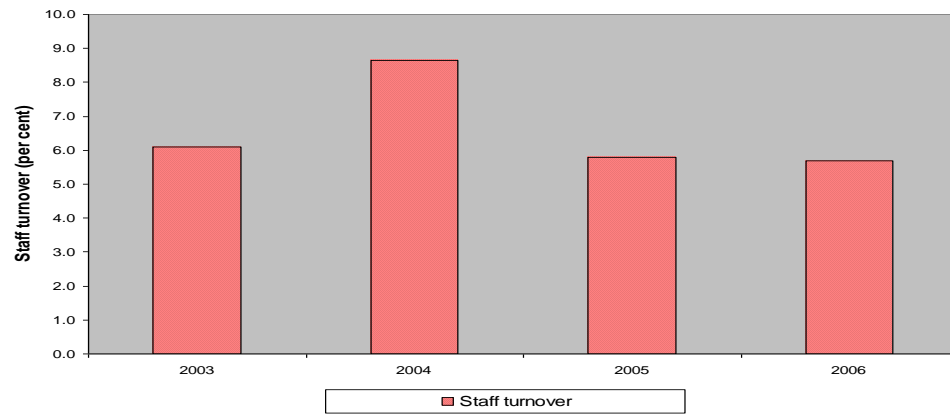
Training programme for employees covering: basic skills, NVQ attainment in Business Techniques, educational assistance, technical skills and work culture.

One member organisation reported that during 2006, approximately 280 employees completed an NVO2 Qualification in Business Improvement Techniques and five employees achieved level three in the same qualification. Additionally, 36 employees achieved a National Numeracy and Literacy Certificate and 13 employees successfully completed a further or higher educational programme; another 80 enrolled onto a programme.

In stamping and tooling operations: Employees participated in a programme developed by the **Automotive Academy** and funded by the **Learning Skills Council** for employees to complete NVQ2 in Business Improvement Techniques.

Thirty production operators achieved NVQ2 in Performing Manufacturing Operations. Several employees completed BEng in Manufacturing Engineering Systems at Swansea Institute and one employee completed Open University degree in engineering which is sponsored by the company.

### 4.5.4 Staff turnover



An annual 5.7 per cent staff turnover is extremely low. Many other sectors' turnover is double this and in some sectors it is not uncommon to have staff turnover figures in excess of 30 per cent.

Even though 2006 saw the closure of the Peugeot Ryton plant, the figures demonstrate this member's commitment to find future employment for Ryton staff.

A Resource Centre was created with more than 6,000 alternative job opportunities available to the 2,050 employees concerned. Nine job fairs were organised on site, with the involvement and support of many other organisations and employers.

As a result of the success of the support arrangements put in place to help employees, the closure date was brought forward from the planned date. Many employees found alternative employment or sought to leave in order to pursue personal plans. The other employees were supported with information on setting up a business, retraining, redeployment within the Group or early retirement.

As a result of the support of the manufacturing division, its management and employees, this closure programme was concluded without a single day of industrial action and with the achievement of all quality, safety and volume objectives.

### 4.6 Supply chain

"Carbon footprint" is a term increasingly used to identify the climate change impact of a product or service. We estimate that just ten per cent of the life cycle CO<sub>2</sub> emissions are generated through the manufacturing process, including the supply chain.

We have yet to establish the supply chain element of the process. However, signatories continue to make effort to reduce the climate change impact of this activity.

Some examples are illustrated below.

Examples of carbon reduction in the supply chain:

- A new milk round system introduced with 48 of their suppliers and another 20 to be introduced in 2007 to reduce vehicle movement and maximise vehicle load.
- A manufacturing strategy was introduced - 60 per cent of parts to be sourced in the continent of manufacture/consumption therefore less ocean freight.
- UK VMI (Vendor Managed Inventory) Hub agreement in place - plan to consolidate overseas shipment in UK.
- Revised supplier routes and reduced mileage by 2,000 miles per week, equating to 760 litres of fuel per week.
- Reviewed aerodynamics of freights/logistics vehicles to improve fuel efficiency and reduce the carbon footprint.
- Vehicles taken out of service to improve vehicle utilisation.
- All drivers sent on a defensive and economic driver training course to improve efficiency.
- Undertook trials using different tyres to improve vehicle efficiency and increase the number of miles per gallon.

## 5.0 Vehicle use



# 5.0 Vehicle use

## 5.1 Introduction

Vehicle usage, or miles driven and their impact, is covered in this section. As in other sections we focus on the fundamental issues:

- CO<sub>2</sub>
- Air quality
- Safety

We acknowledge other use impacts such as noise, but primarily focus on the above three elements.

The use phase of the vehicle has the highest environmental impact, therefore ensuring the use impact is managed is seen as a priority by the vehicle manufacturers. Engine and vehicle technology are all developed to support this agenda.

We should recognise that it is not always possible to develop a strategy to improve CO<sub>2</sub>, air quality and safety at the same time, or at the same rate, in a cost-effective way. Air quality and safety regulation can conflict with CO<sub>2</sub> reduction strategy, by adding weight and requiring advanced powertrain technology for air quality.

Please see the SMMT website:

### "The evolution of the car"

FORD FIESTA

1996



2007



## 5.1.1 Comparative data

As in previous years, we will analyse the five best-selling model ranges in each segment and compare these with performance by those models in 2000, the first major year of our reporting.

This comparison highlights the progress toward cost-effective, sustainable transport; making cars cleaner, safer and reducing CO<sub>2</sub>. This is something other sectors and other transport modes should also demonstrate in a clear comparative way.

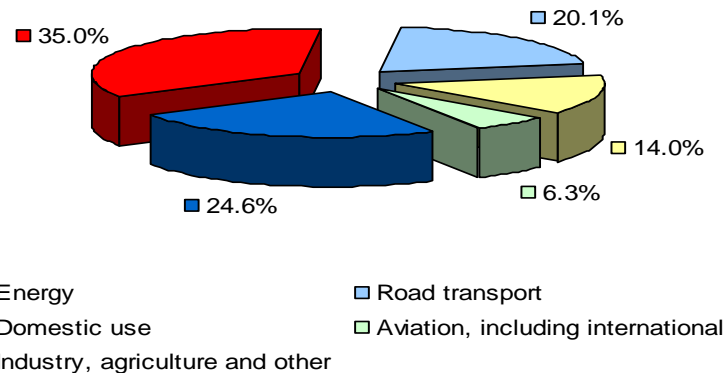
Segment	Best seller 2006	
Supermini	Ford Fiesta	
Lower medium	Ford Focus	
Upper medium	BMW 3 Series	
MPV	Vauxhall Zafira	
Dual purpose	Honda CR-V	

Source: SMMT



## 5.2 CO<sub>2</sub>

### 5.2.1 Sources of CO<sub>2</sub>



Source: NAEI. DEFRA

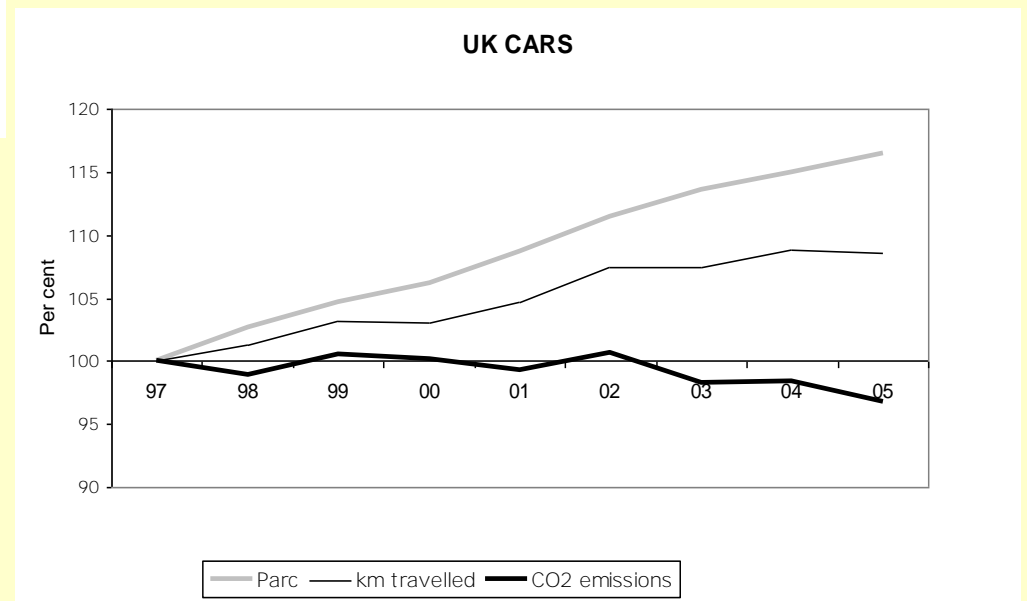
In the UK one in every five tonnes of CO<sub>2</sub> emitted in 2006 was from road transport, of which, cars contributed just one in every eight tonnes. In recent years, growth in CO<sub>2</sub> emissions has been generated from the commercial, light and heavy goods sectors.

This increase in CO<sub>2</sub> emissions from commercial vehicles has been accompanied by strong economic growth, a rise in the transport of finished or semi-finished goods, as opposed to raw materials, and a growth in deliveries to customers products and services.

### 5.2.2 Tailpipe CO<sub>2</sub> emissions

Total road transport CO<sub>2</sub> emissions are a function of more than just vehicle technology. The number of vehicles and the distance driven will impact total CO<sub>2</sub> value. This calls for an integrated approach to address total transport CO<sub>2</sub>.

The graph below shows that total emissions for cars declined despite more cars in use and greater distance travelled. This is a reflection of the increased efficiency of cars.



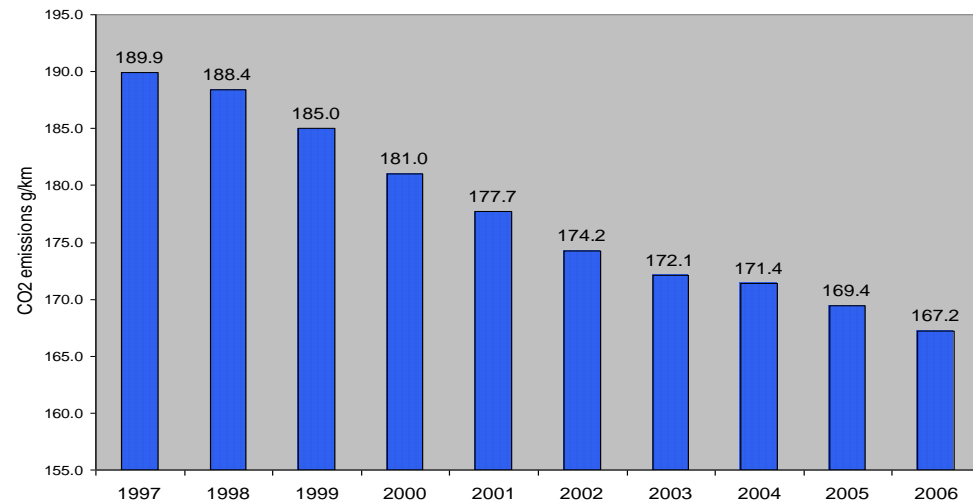
Source: SMMT



The Department for Transport is to invest £10m into the Act on CO<sub>2</sub> campaign. It aims to raise the awareness of the contribution each person can make to reduce climate change. It facilitates the means to make an informed decision while buying and driving a car in the context of a personal carbon footprint.

[www.dft.gov.uk/actonCO2](http://www.dft.gov.uk/actonCO2)

### 5.2.3 New car tailpipe CO<sub>2</sub> grams per kilometre

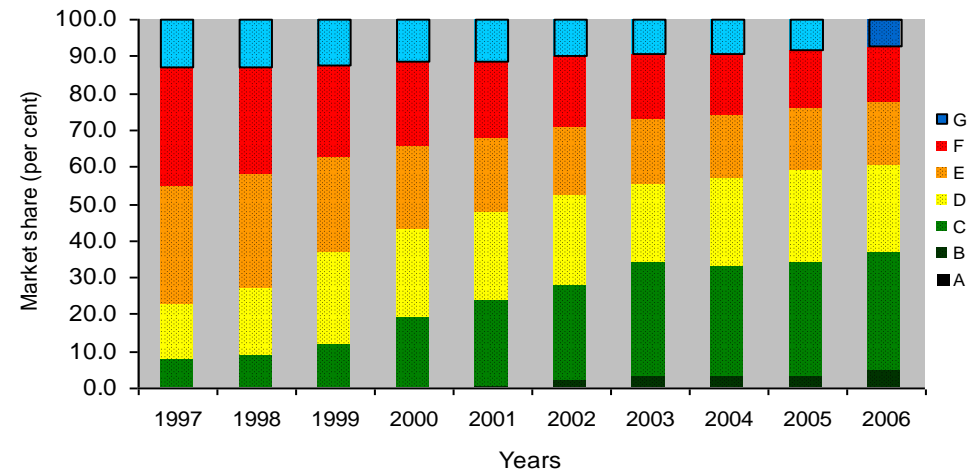


Source: SMMT

Average new car CO<sub>2</sub> fell to 167.2 g/km in the UK in 2006. New product availability in the Supermini segment and an increase in the rate of reduction in new car CO<sub>2</sub> for private buyers are a positive trend.

SMMT forecast strong development of new, lower carbon technologies such as "stop start", regenerative braking, and enhanced electrical systems, which will become more widely available. As well as reducing reported data these technologies can enhance real world driving economy.

### 5.2.4 New car tailpipe CO<sub>2</sub> by VED band

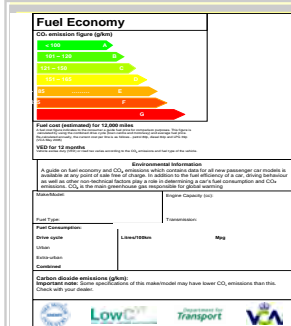


Source: SMMT

The SMMT has been monitoring new car CO<sub>2</sub> since 1997. The graph above illustrates the change in the new car fleet up to 2006.

To further achieve average new car emission reductions, more cars will need to be developed and sold in the "A" and "B" bands, currently around five per cent of sales.

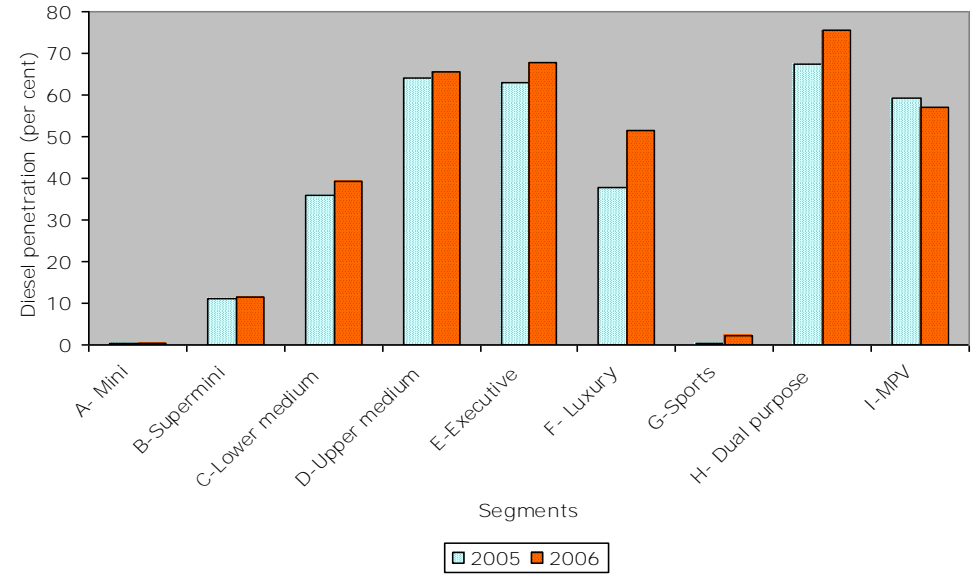
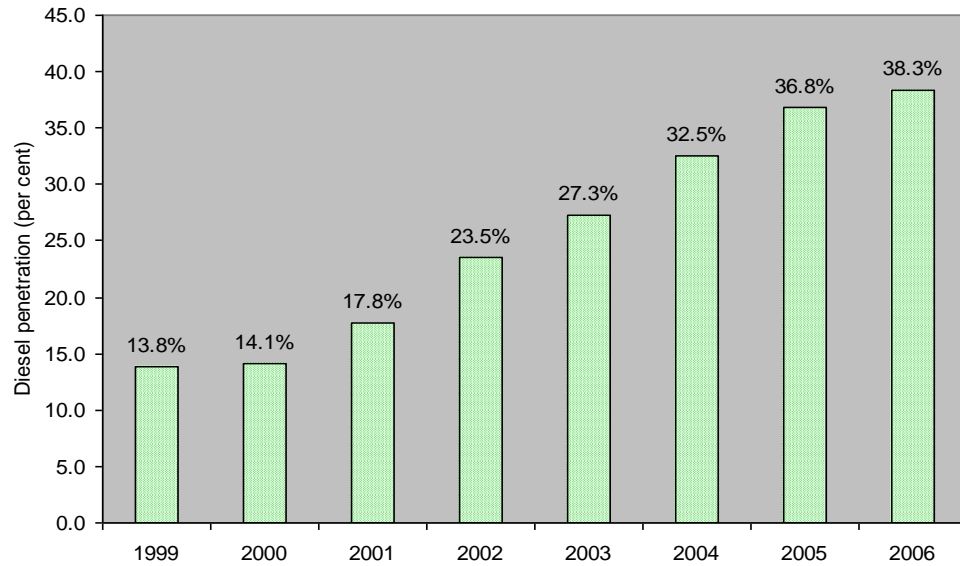
The new "G" band (newly introduced in 2006) accounts for just over seven per cent of sales. We have apportioned "G" band for previous years.



The voluntary colour-coded label turned out to be a success, providing customers with a full view of the vehicles' running costs and environmental implications.

A survey conducted by LowCVP regarding label compliance (across all dealerships selling new cars) shows a significant improvement. Recent data show 86 per cent of dealerships displaying the label compared with 65 per cent in year 2005. <sup>(6)</sup>

## 5.2.5 Uptake of diesel



Source: SMMT

In the last six years there has been a significant increase in the diesel penetration of new cars sold in the UK, from 14.1 per cent in 2000 to 38.3 per cent in 2006. This uptake of new clean diesel technology has predominantly been in the large car sector. Diesel penetration in smaller, lower mileage cars remains low, the price of diesel is making the economics of selection an issue.

Table 5.2.5 Best-selling models - CO <sub>2</sub>		2000	2006	% down	
Supermini	Ford Fiesta - diesel	136	Ford Fiesta - diesel	116	-14.7
Lower medium	Ford Focus - diesel	142	Ford Focus - diesel	124	-12.7
Upper medium	BMW 3 Series - diesel	152	BMW 3 Series	150	-1.3
MPV	Vauxhall Zafira - diesel	177	Vauxhall Zafira - diesel	162	-8.5
4x4	Honda CRV - petrol	229	Honda CRV- diesel	173	-24.5

\* BMW 3 Series -diesel- 123 g/km CO<sub>2</sub> available from September 2007

Source: VCA [www.vcacarfueldata.org.uk](http://www.vcacarfueldata.org.uk)

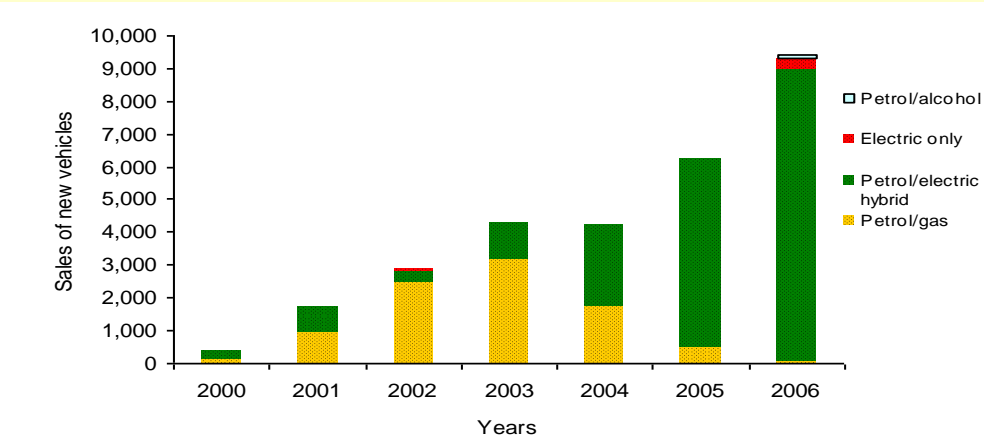
In the last few years, CO<sub>2</sub> from best-selling models has been reduced by up to 24 per cent. This is largely as a result of improved direct injection diesel technology.

The introduction of more environmentally friendly models to the market and their popularity amongst buyers, resulted in a further cut of 2.2 g/km in new car CO<sub>2</sub> emissions in 2006.

Since 1997, on average, there has been a cut of at least 2.5 g/km per year per new vehicle.

# 5.3 Alternative fuels

## 5.3.1 Sales of alternative fuelled vehicles



Source: SMMT

During the last six years there has been a significant increase and change in the nature of sales of alternative fuel cars.

New cars are no longer supplied with LPG fuel option, sales declined as a result of a change in duty differential and withdrawal of subsidy, illustrating the need for more consistent legislation to effect market transformation.

Sales of hybrid vehicles have increased through greater model availability.

During 2006 sales of flex fuel (cars capable of running on blends of ethanol up to 85 per cent) started and SMMT recorded the sales of electric cars and Quadra cycles. However, with sales of just 9,439 this represents just 0.4 per cent of the UK market.

## 5.3.2 Biofuels and flex fuel vehicles

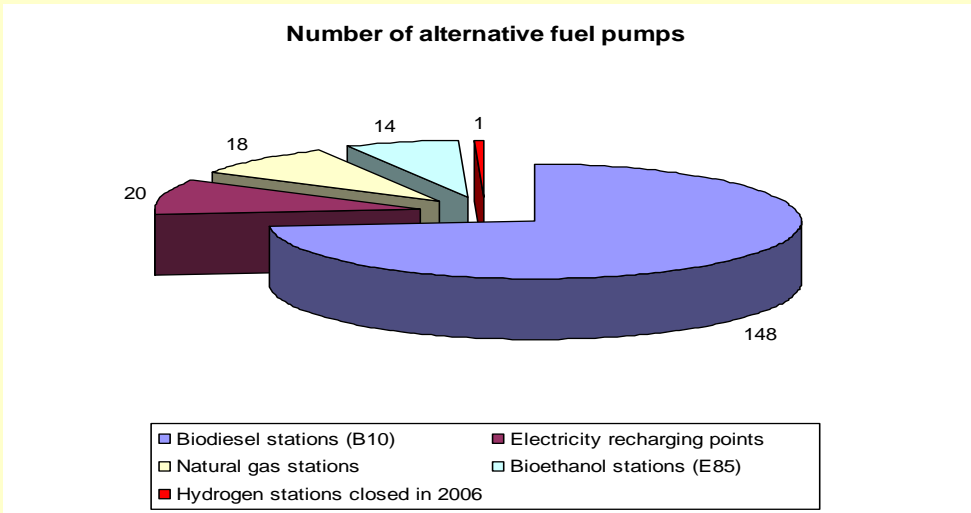
Sustainable biofuels have an important role in the UK and Europe for meeting their commitments for CO<sub>2</sub> emission reduction, through an integrated approach.

Biofuels can be used in their pure form, or more typically as a blend with petrol and diesel (typically less than five per cent). The main fuel types are biodiesel, bioethanol and biogas.

The Renewable Transport Fuel Obligation (RTFO) Programme will, from April 2008, place an obligation on fuel suppliers to ensure that a certain percentage of their aggregate sales is made up of biofuel.

The effect of this will be to require 5 per cent of all UK fuel sold in the UK to come from a renewable source by 2010.

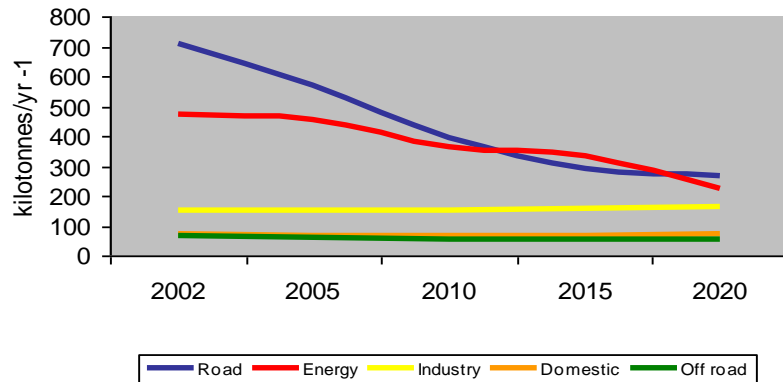
The RTFO is modelled on the existing Renewables Obligation in the UK electricity supply industry and expects to reduce carbon emission from road transport in 2010 by about 1 million tonnes. <sup>(7)</sup>



Source: Energy Saving Trust

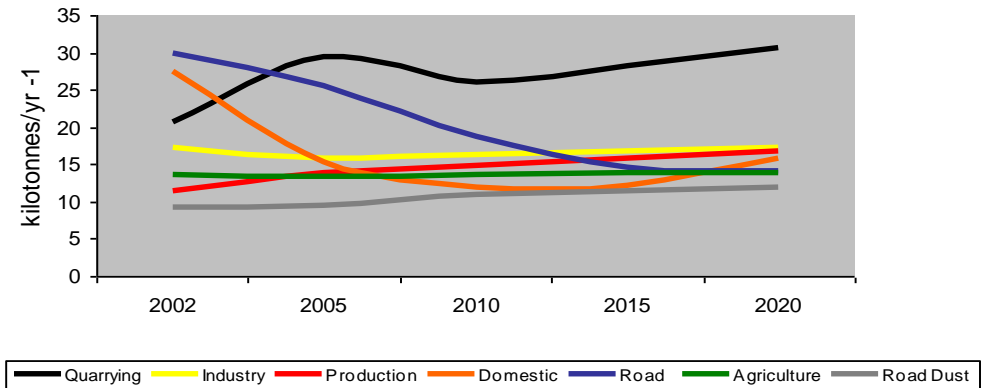
## 5.4 Air quality

### 5.4.1 NOx emissions



Source: Netcen

### 5.4.2 PM10 emissions



Source: Netcen

Since the 1970s, the amount of polluting elements in tailpipe emissions has decreased radically. Diesel engines now emit 95 per cent less nitrogen oxide (NOx) and PM10 than was the case 25 years ago. Exhaust emissions from trucks have fallen by 40 per cent since the mid 1990s, although the number of kilometres driven has risen 4 per cent.

Since 1992, the process has involved the introduction of a number of "Euro" standards, involving the introduction of the catalyst converter, particulate matter filters and other measures. The Clean Air For Europe Programme (CAFÉ) predicts a more than 90 per cent reduction in NOx by 2020, even without Euro 5 coming into force (foreseen for 2009). An important environmental challenge is now keeping cars affordable and replacing old vehicles with new ones. <sup>(8)</sup>

### Low Emissions Zones (LEZ)

From 4 February 2008 the first Low Emission Zone will be in operation.

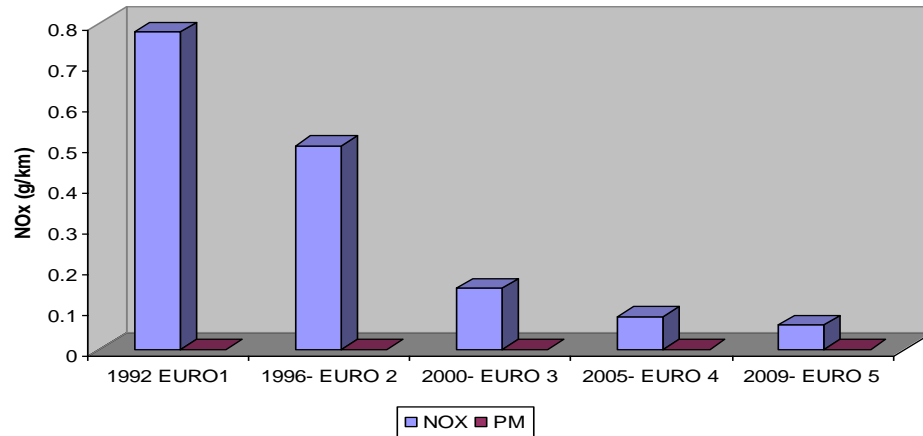
The LEZ covers most of Greater London following the Greater London Authority boundary. The vehicles affected are older **diesel-engined** trucks, coaches, buses, large vans, minibuses and other specialised vehicles that are derived from trucks and vans such as motor caravans and motorised horse boxes.

The emissions standards for the Low Emission Zone (LEZ) are based on Euro standards which vehicles must comply with when manufactured. Vehicles that do not meet the specified emissions standards can be used within the Zone, but operators will be subject to a substantial daily charge. However, the greatest improvement in road transport derived air quality in London will come from progressive vehicle technology.

[www.tfl.gov.uk/roadusers/lez](http://www.tfl.gov.uk/roadusers/lez)

## EURO 5 & 6 (cars), EURO V & VI (trucks)

NOx and PM standards for petrol cars



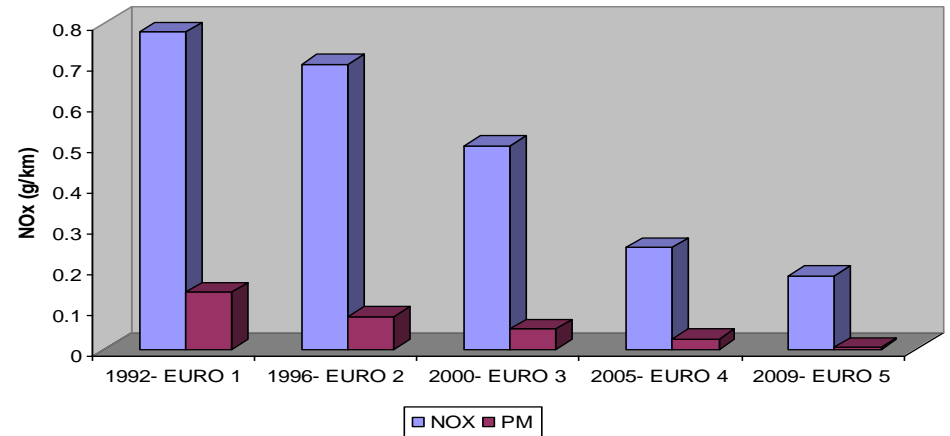
Source: SMMT

The emission standard currently for **light-duty vehicles**, is Euro 4. Euro 5 and Euro 6 standards have already been agreed by Council and Parliament.

Euro 5 will enter into force in September 2010 for all cars. Euro 5 will reduce the emission of particulate matter from diesel cars from 25 mg/km to 5 mg/km. Euro 6 is scheduled to enter into force in January 2014 and will reduce the emissions of NOx from diesel cars further, from 180mg/km to 80 mg/km.

The current legislation for **heavy-duty vehicles** defines the emission standard currently in force, EURO IV, as well as the next stage (EURO V) which will enter into force in October 2008. <sup>(8)</sup>

NOx and PM standards for diesel cars
























Source: SMMT

'This Government has consistently encouraged the use of cleaner fuels, technologies and vehicles, for example through graduated vehicle excise duty, the reformed company car tax structure and fuel duty differentials. The Government announced in Budget 2007 that it would consider the case for incentivising the early uptake of Euro 5 and subsequently Euro 6 technology through Company Car Tax and other instruments. An incentive for Euro 6 take up cannot be provided until Euro 5 is mandatory.

Incentivising the earlier up-take of cleaner diesel vehicles at the Euro 5 and 6 levels could improve greenhouse gas emissions and also help to realise the co-benefits from air quality and climate change policies as discussed by Stern. The modelling of this measure estimates likely benefits to the UK net of the associated costs in the region of £246 to £595m per annum, although a full impact assessment of the implementation options is yet to be undertaken.' <sup>(9)</sup>

### 5.4.3 Vehicle air quality emissions

**Table 5.4.3 Best-selling models - lowest CO<sub>2</sub>**

	CO <sub>2</sub>	PM 10	NOx	HC and NOx	CO
<b>2000 values</b>					
Ford Fiesta - diesel	144	0.049	0.454	0.48	0.157
Ford Focus - diesel	142	0.036	0.489	0.727	0.526
BMW 3 Series - diesel	152	0.035	0.411	0.46	0.245
Vauxhall Zafira - diese	177	0.044	ND	0.574	0.591
Honda CR-V - petrol	229	ND	0.444	ND	0.957
<b>2006 values</b>					
Ford Fiesta - diesel	116	0.02	0.192	0.207	0.173
Ford Focus - diesel	124	0.019	0.205	0.221	0.178
BMW 3 Series - diesel	150	0.02	0.202	0.224	0.08
Vauxhall Zafira - diese	162	0.001	0.198	0.224	0.21
Honda CR-V - diesel	173	0.023	0.137	0.155	0.116
<b>Percentage change</b>					
Ford Fiesta	-19.44 	-59.18 	-57.71 	-56.88 	10.19 
Ford Focus	-12.68 	-47.22 	-58.08 	-69.60 	-66.16 
BMW 3 Series	-1.32 	-42.86 	-50.85 	-51.30 	-67.35 
Vauxhall Zafira	-8.47 	-97.73 	N/A	-60.98 	-64.47 
Honda CR-V	-24.45 	N/A	-69.14 	N/A	-87.88 

Source: VCA  
ND = No data

[www.vcacarfueldata.org.uk](http://www.vcacarfueldata.org.uk)

The table, based on VCA data, illustrates further improvement in air quality and CO<sub>2</sub> comparison with year 2000 values.

The challenge of improving CO<sub>2</sub> and air quality emissions from vehicles is a real one. Engineering resources, costs and time-frame all need higher investment from vehicle manufacturers.

Product development cycles dictate opportunities to improve performance. Powertrain development cycles are in excess of ten years.

Vehicle Excise Duty was one of the instruments used to move toward lower carbon transport.

The Government reformed Vehicle Excise Duty in 2001 to move to a carbon dioxide-based graduated system.

In 2006, further reforms were announced by the government to introduce further benefits to encourage uptake of the fuel-efficient cars.

A new higher band of VED (Band G) has been set at £210 for the most polluting new cars, while VED for the least CO<sub>2</sub> emitting vehicles has been reduced to £0 to aid the development of the low carbon vehicles market.

## 5.5 Safety

### 5.5.1 Product safety


Euro NCAP provides useful guidelines on car safety across different ranges.


The table below compares the NCAP rating for five top-selling cars in different market segments. It highlights a significant improvement within passengers' and pedestrians' safety.

These safety developments have been achieved despite the constant struggle to balance additional safety features and weight gain linked with CO<sub>2</sub> emission.

Best-selling models - ncap safety	Reference year			Reference year		
Ford Fiesta	1997	☆☆☆	ND	Ford Fiesta	2002	☆☆☆☆☆ ☆☆☆
Ford Focus	1999	☆☆☆☆☆	ND	Ford Focus	2004	☆☆☆☆☆☆ ☆☆☆
BMW 3 Series	1997	☆☆☆	ND	BMW 3 Series	2005	☆☆☆☆☆☆ ☆
Vauxhall Zafira	2001	☆☆☆☆	ND	Vauxhall Zafira	2005	☆☆☆☆☆☆ ☆☆☆
Honda CR-V	2002	☆☆☆☆☆	☆☆☆☆☆	Honda CRV	2007	☆☆☆☆☆☆ ☆☆☆

ND - No Data

 - Passenger protection

 - Pedestrian protection, changed to a more stringent test after 1 January 2002

[www.euroncap.com](http://www.euroncap.com)

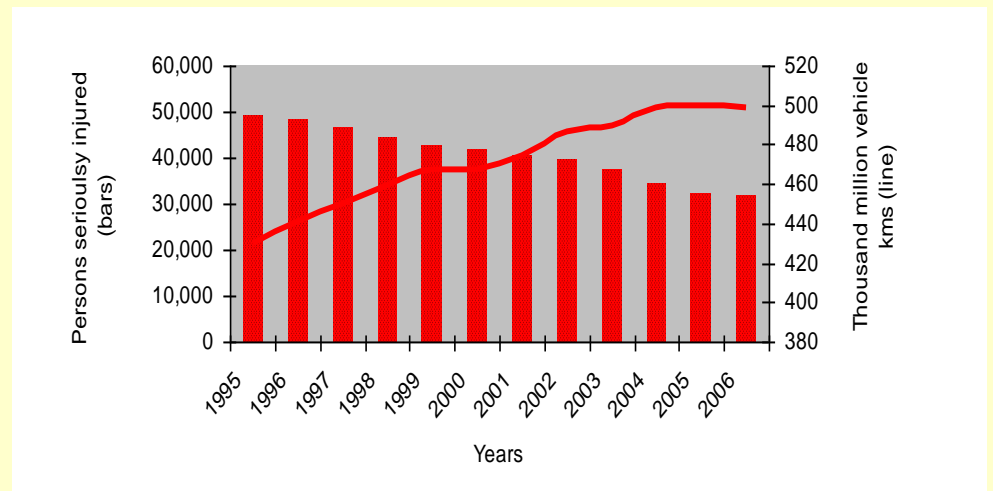
Source: Euroncap

### 5.5.2 Serious injuries and miles travelled

Further decline in serious personal injuries can be noticed despite growing traffic levels.

This fact could be linked to continuous technical advancements as well as improvement in road infrastructure design.

Safety features focus not only on passengers' safety but equally on better front design to limit injury to pedestrians and cyclists.



Source: Department for Transport <sup>(10)</sup>

The popular supermini section of the Euro NCAP classification is the most challenging with regard to balancing weight and safety. The most recent additions to this class prove that a marriage between the two is possible and commercially successful.

This type of information is sought by more and more people who are concerned by climate change issues, and safety, and who want to take advantage of growing tax incentives.

			
<b>BMW MINI</b>	2007	☆☆☆☆☆	☆☆☆☆
<b>Peugeot</b>	2006	☆☆☆☆☆	☆☆☆☆
<b>Vauxhall Corsa</b>	2006	☆☆☆☆☆	☆☆☆☆



## 6.0 Vehicle disposal



# 6.0 Vehicle disposal

## 6.1 End of life vehicles

### 6.1.1 The End-of-Life Vehicle (ELV) directive

Implementation of Directive 2000/53/EC in 2005 has impacted on the design and disposal phase of a vehicle by:

1. Setting targets for reuse, recycling and recovery of materials from vehicles.
2. Setting environmental standards for vehicle dismantlers and scrap metal recyclers.
3. Requiring manufacturers to consider ELV in the design and manufacture of vehicles, and to restrict the use of certain materials in vehicles, e.g. lead.
4. Introducing certificates of destruction (CoD) to capture disposal through authorised treatment facilities.

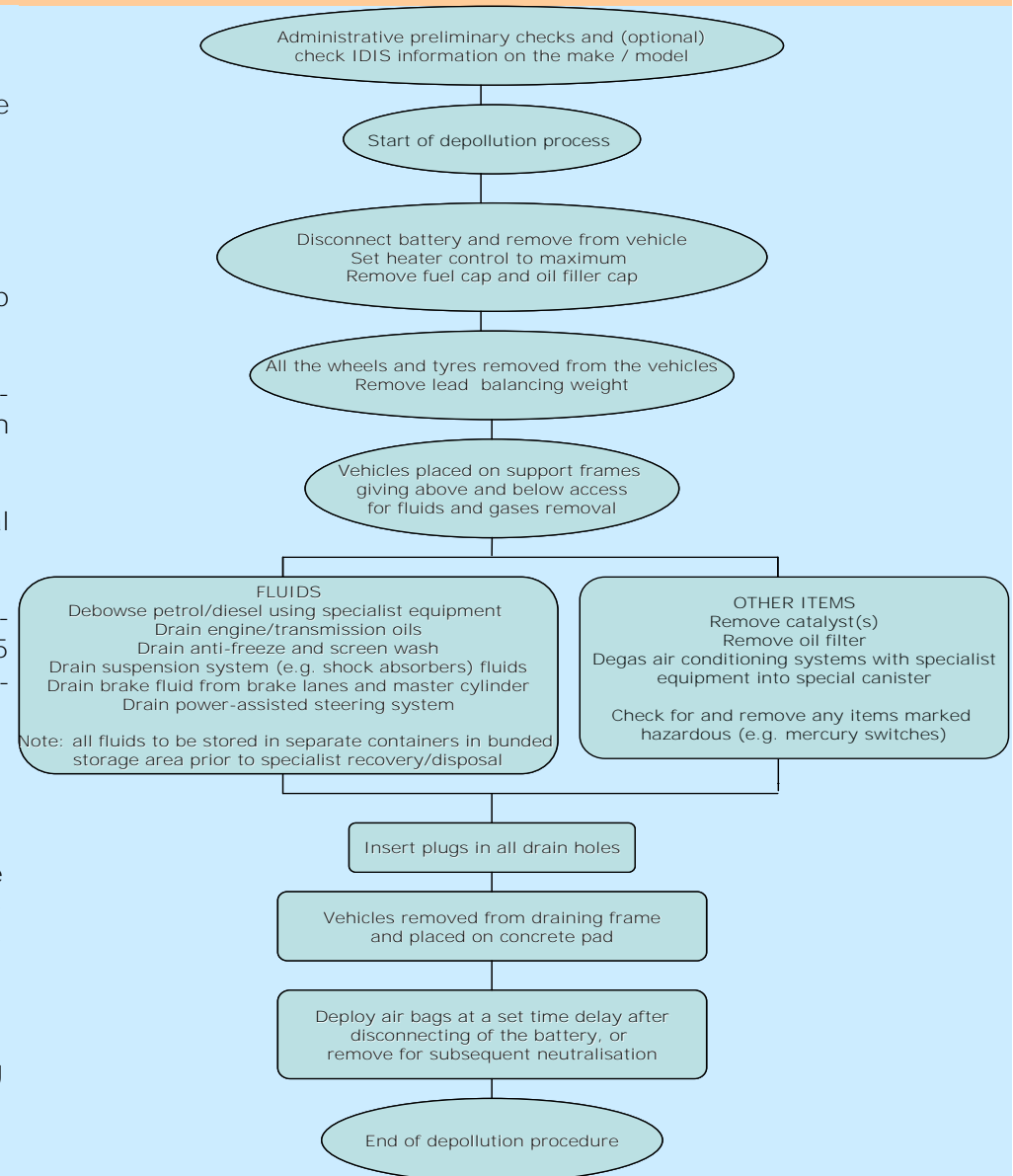
To address this, all manufacturers of cars and light vans have to demonstrate that they have systems in place to achieve recycling rates of 85 per cent by weight. Plans are being developed by the European Commission to increase this to 95 per cent by 2015.

### 6.1.2 Process and methods

To improve environmental standards, vehicles are now required to be depolluted. This is achieved by removing the battery, draining and collecting all fluids, removing the tyres, draining and collecting the air conditioning gas, removing the oil filter and any known hazardous material, such as lead wheel weights.

Cars with air bags and seat belt pre-tensioners are increasingly arriving as ELVs and these must be deployed as part of the depollution process.

Source: Environment Agency



### 6.1.3 Vehicle design

In 2005, the Department for Trade and Industry (DTI) contracted the Consortium for Automotive Recycling (CARE) to conduct a trial to determine the metallic content of cars being scrapped.

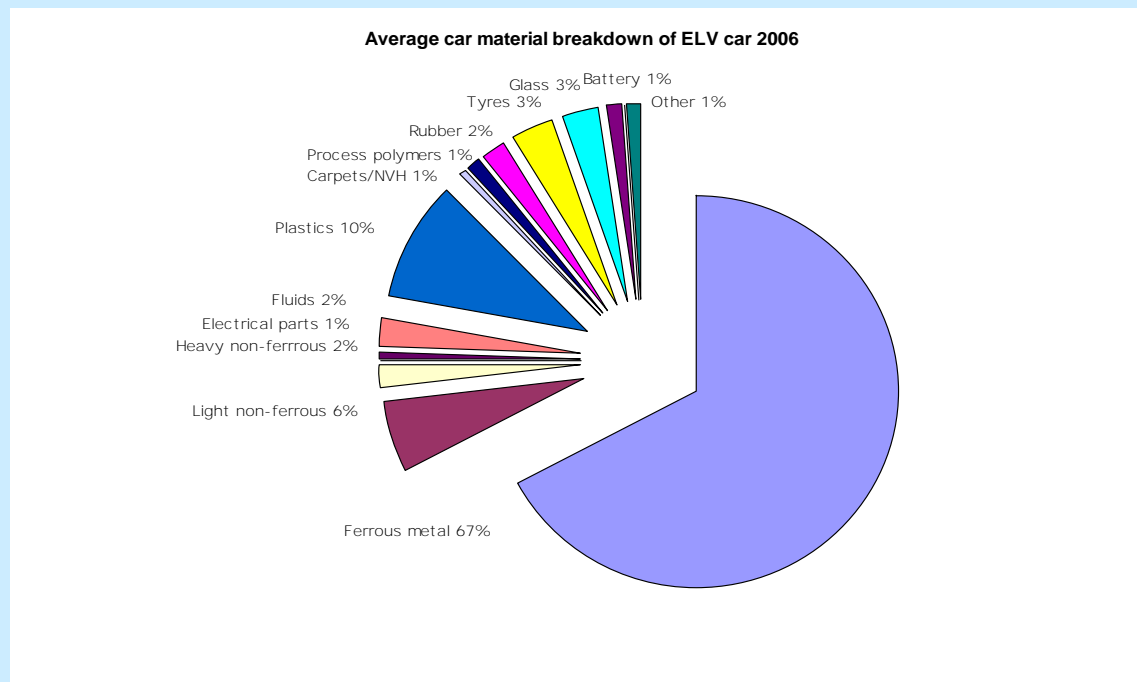
The result was that 75 per cent of a car is metallic and a further 1 per cent is fuel, all of which is currently recycled. Therefore, producers and authorised treatment facilities (ATFs) need to reuse, recycle or recover an additional 9 per cent vehicle weight to meet the 85 per cent target set by the ELV regulations.

Some ATFs will remove components for resale or for specific material stream recycling. Ultimately, however, cars will end up at a shredder site where the car will be reduced to small pieces and then further separated into material streams for ongoing recycling or energy recovery.

### 6.1.4 Establishment of take back networks

From January 2006, all manufacturers of cars and light vans have put in place a network of ATFs to receive and treat vehicles for recycling and recovery. The ATFs are spread across the UK to provide convenience for last owners who will be given a certificate of destruction **(CoD) as proof of the vehicle's de-registration**, relieving them of any obligations for continuous taxation of the car. The networks that have been set up are managed by either of the two following organisations:

- Autogreen [www.autogreen.org](http://www.autogreen.org)
- Cartakeback [www.cartakeback.com](http://www.cartakeback.com)

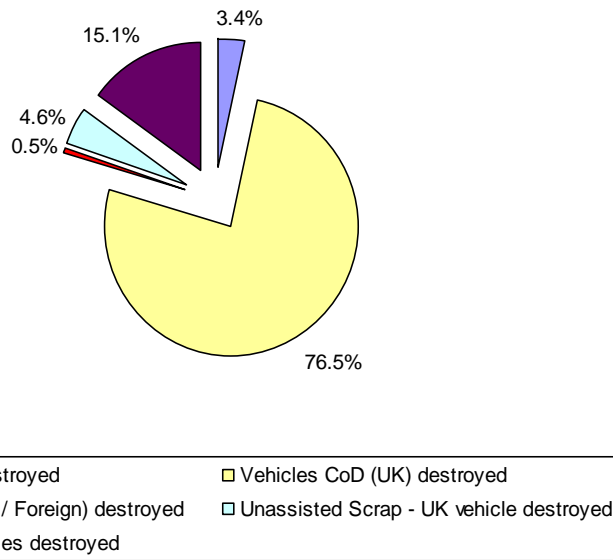


Source: SMMT

### 6.1.5 Recycling/recovery performance 2006

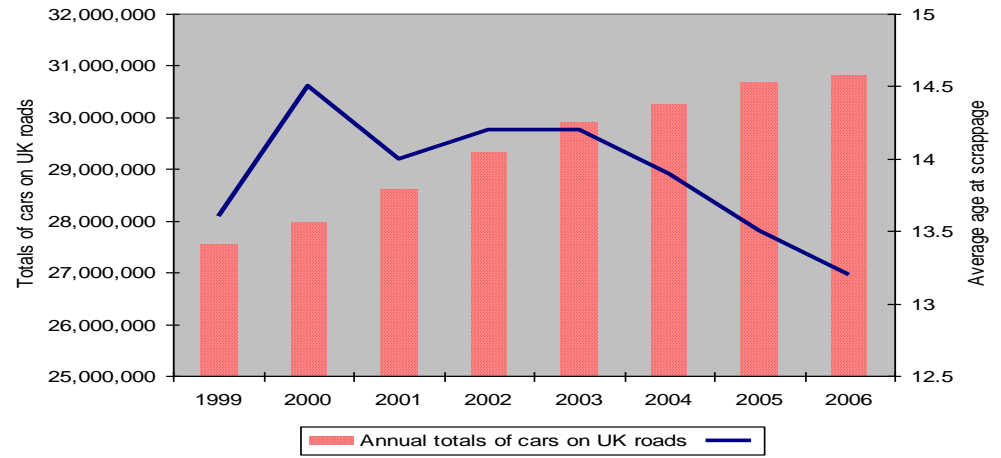
2006 saw the introduction of the certificate of destruction (CoD) which is issued on behalf of the DVLA when a vehicle is scrapped. Around 842,000 certificates were issued, about half of what was expected. The DVLA also allows an alternative method of de-registering a vehicle and the industry estimates that a further 500,000 vehicles took this method, bringing the total deregistration by scrapping closer to previous years, when it was between 1.6 and 1.8 million. Industry is pressing the DVLA to enforce the CoD route as required by the Directive.

Vehicle manufacturers have reported to Government that they have achieved the 2006 recycling and recovery targets of 80 per cent and 85 per cent respectively.



CoD- Certificate of destruction.  
 NoD- Notice of destruction (vehicles category M1 and N1).  
 Unassisted scrap- Scrapped vehicles with partially correct vehicle identification number.

Source: DTI



Source: SMMT

While the number of cars on the roads increases, the average age of a car scrapped went down to 13.2 years in 2006.

This is a positive trend which suggests earlier introduction of new cars, which tend to be more environmentally friendly.

Older cars and vehicles will have lower air quality and higher CO<sub>2</sub> emissions as a result of product development and the progression of "Euro" cycles.

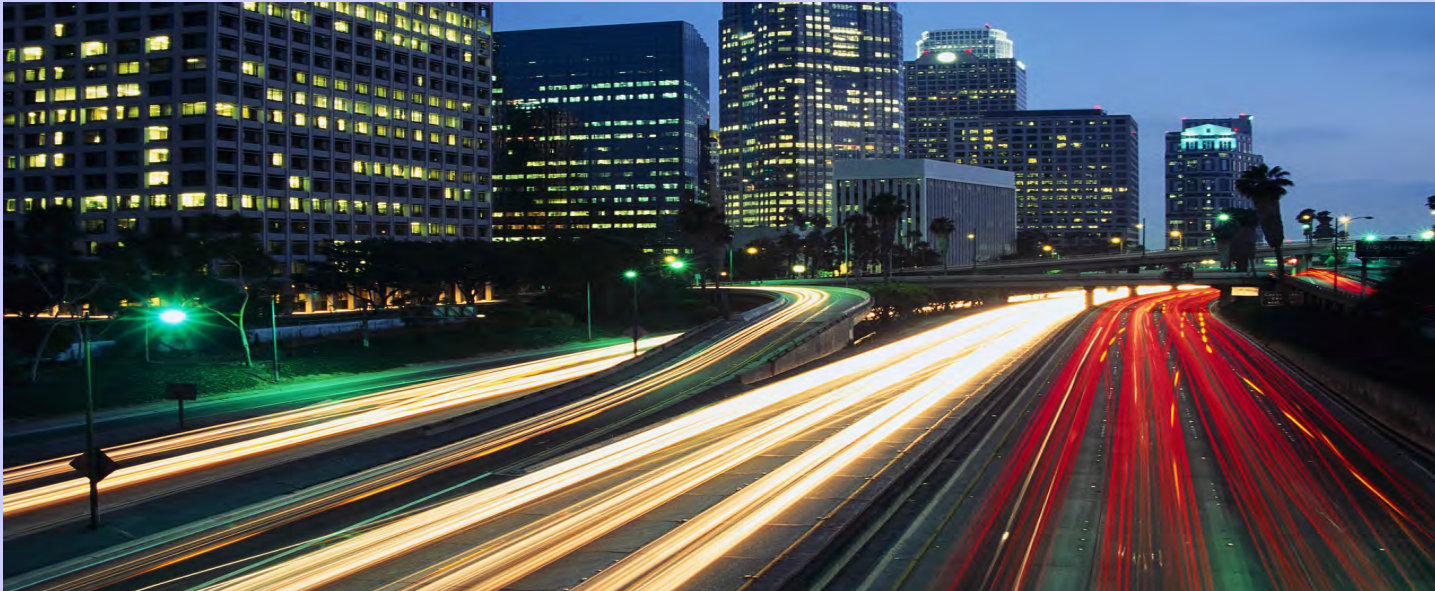
Emissions from vehicles are a function of the profile of the vehicle "parc", all vehicles being driven on the road. Development of a newer fleet should improve safety and air quality as well as having climate change benefits.

#### Scrap steel

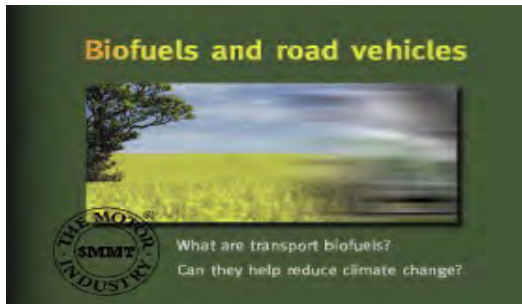
Scrap steel from motor vehicles is recycled into new product. Automotive scrap is a major feedstock to the global steel industry. This reduces the energy needed to mine and process raw materials for new steel.

In lifecycle terms the energy saved in using scrap steel more than compensates for the energy used in the end-of-life process.

# 7.0 Stakeholder engagement



## 7.0 Stakeholder engagement



During 2006 SMMT and its members continued its programme of continuous active stakeholder engagement at European, national and regional levels.



As interest in the issue of sustainability, and climate change in particular, increases SMMT looks to address these complex issues in an open and honest way, publishing data on the performance of the industry throughout the lifecycle of its products.

SMMT also feels responsibility to engage on the wider agenda, to take the sustainability debate to other sectors and organisations.

SMMT publishes and makes available information on

- Biofuels
- Industrial, economic and commercial activity
- Greener driving guides
- Sustainability

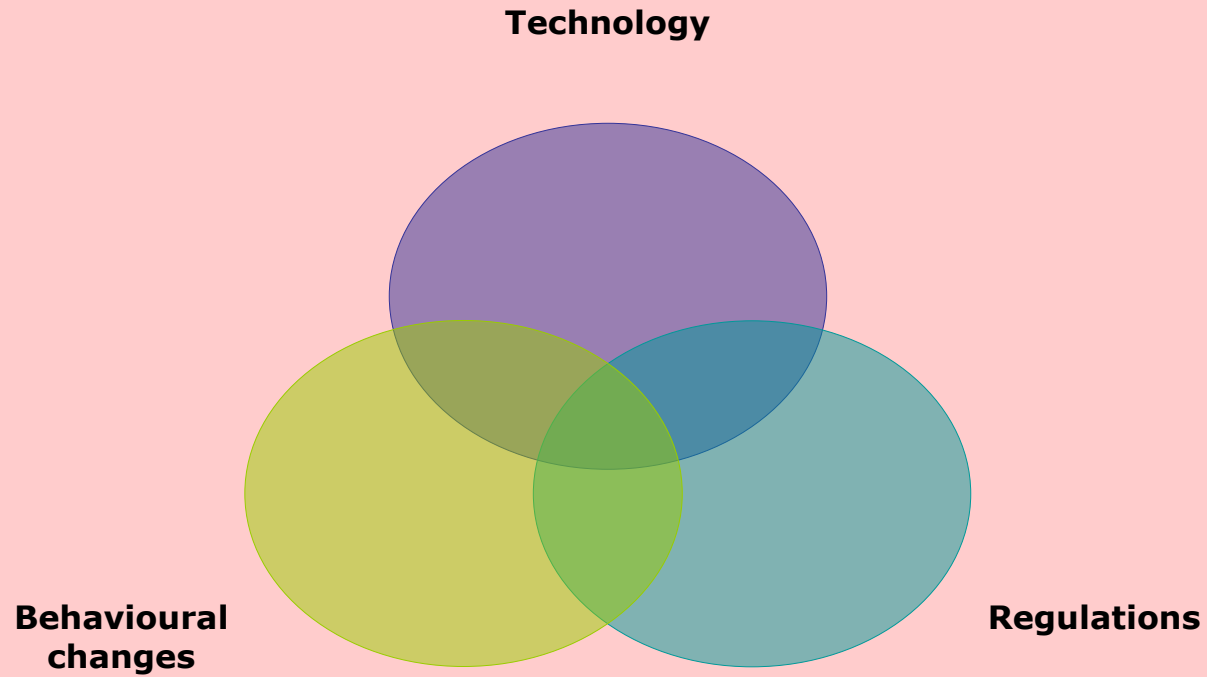


The SMMT aims to become a source of knowledge and information on sustainability and climate change issues.

The objective is to develop this programme during 2007 and 2008, to demonstrate the commitment of members to sustainable motoring and highlight where other stakeholders need to act.



# 8.0 Integrated approach



## 8.0 Integrated approach

### Strategy to reduce carbon - Stern report

On 30 October 2006 Nicholas Stern published his report on the Economics of Climate Change, which was commissioned by the British government.

This review has assessed a wide range of evidence on the economic impact of climate change and its costs, and leads to a simple conclusion: the benefits of strong and early action far outweigh the economic cost of not acting. Stern identifies that there is a market failure in addressing the need to reduce carbon. The report highlighted three strategies to carbon reduction:

- Technology
- Carbon price – including fiscal, trading and regulation
- Removal of barriers to change consumer behaviour

Stern states all three strategies must be deployed to ensure timely and effective progress to carbon reduction.

SMMT has broken these down into **12 strategies to address carbon reduction from road transport**, (see page 41–42) four of which automotive manufacturers have direct responsibility for, the rest are a combination of organisational and individual change and carbon pricing.

The UK automotive sector recognises and identifies the worth of this combined strategy for carbon reduction. In the following pages we identify key areas and stakeholders.

### Increases in carbon from road transport

All stakeholders need to recognise that despite efforts to reduce carbon from road transport there will be factors that work against this strategy.

These include:

- Legislation and quasi legislation for safety and air quality
- Increasing number of vehicles on the road
- Increase in the distance driven
- Creating adverse planning environment where distance between home, work and leisure increase the demand for road transport
- Consumer choice of vehicle



# Low carbon road transport - technology



## 1. Power train technology

Vehicle and component manufacturers

To design, develop and market more efficient drivetrains, engines and gearboxes.



## 2. Fuel technology

Fuel companies

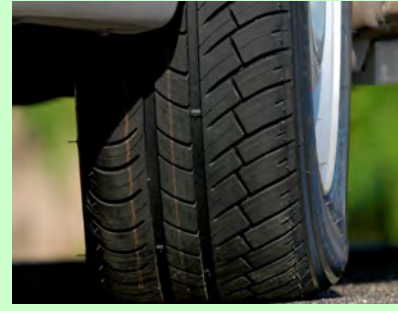
Development of sustainable bio-fuels to reduce the carbon content of fuels.



## 3. Infrastructure technology

Highways Agency devolved administrations

Maintain safe consistent traffic flows, reduce congestion and improve journey times.



## 4. Vehicle technology

Vehicle and component manufacturers

To design, develop and market tyres, lubricants and other CO<sub>2</sub> reduction technologies

# Low carbon road transport – removing barriers to change



## 5. Smarter driving

Driving Standards Agency, employers and individuals

Learning smarter, anticipatory driving skills to reduce fuel consumption.

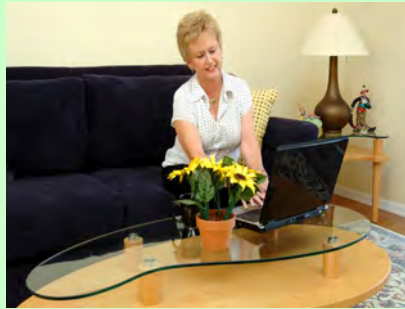


## 6. New vehicle choice

Vehicle manufacturers and retailers

Promote and develop understanding of the offering of lower carbon vehicles, through labelling for example.

## Low carbon road transport – removing barriers to change



### 7. Smarter working

Employers and employees

Reducing travelling by working from home or out of the office, telephone and video conferencing.



### 8. Smarter choices

Department for Transport, devolved administrations, local authorities.

Providing and encouraging high quality, frequent and affordable public transport. <sup>(11)</sup>

## Low carbon road transport – carbon pricing



### 9. Regulation

European and UK government in cooperation with vehicle manufacturers

Better regulation, long term, sustainable, affordable to all parties.



### 10. Fiscal policy

Carbon pricing, fuel duty, Vehicle Excise Duty, Company Car Tax, capital allowances, mileage allowances.

Clear consistent long-term messages.



### 11. Carbon trading

European and UK government

Best value carbon schemes, sectoral parity for carbon price.



### 12. Demand management

UK government and local authorities.

Schemes that reduce congestion, improve traffic flows and recognise new, low carbon technology without creating market distortion.

# Road transport – carbon increases



## A. Air quality emissions

European and UK government

Since 1990 there have been continuous improvements in vehicle technology. This sophisticated equipment complicates carbon reduction engineering strategies.



## B. Need for increased safety

European and UK government

The need for increased safety, both inside the vehicle and external to other road users, this impacts aerodynamics and adds weight.



## C. Increased number of vehicles – increased congestion

European and UK government local authorities

An increase in the number of vehicles will increase congestion. Both increases will add to carbon emissions from road transport.



## D. Planning – increasing the need to travel

UK and regional government

Many factors increase the demand for road transport. Economic, social and planning cannot be excluded from this. They can potentially counteract other strategies.



## E. Consumer choice of vehicle (car, van, truck, bus and coach)

Vehicle manufacturers and consumers

For many reasons a move to larger, better appointed vehicle will increase new vehicle CO<sub>2</sub>, but not necessarily total CO<sub>2</sub>.

# Appendices

<b>Appendix Table 1. Sector fact sheet</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Automotive manufacturing sector turnover (WI) (£ billion)	44.2	42.5	42.2	44.6	46.0	46.2	47.6	48.5
Share of total transport manufacturing turnover (UK	64.0	65.5	64.1	67.6	68.0	67.1	67.4	67.0
Total net capital investment (WI) (£ billion)	2.2	2.2	2.2	1.3	1.2	1.4	1.3	1.4
Automotive sector value added (WI) (£ billion)	9.0	7.8	9.0	8.8	8.5	8.9	8.8	9.0
Total employees directly dependent on the automotive	910,600	891,700	883,200	873,100	877,100	854,400	861,600	851,800
Value of exports (WI) (£ billion)	19.3	19.8	18.0	20.9	21.9	22.5	23.7	24.5
Percentage of total UK export (%)	11.5	10.5	9.5	11.2	11.6	11.8	11.2	10.2
Sector value added share of UK GVA (%)	3.9	3.4	3.8	3.7	3.7	3.4	3.2	3.1
UK sector share of global passenger car production (%)	4.5	4.0	3.7	3.9	3.9	3.7	3.5	3.4
Number of UK volume passenger car manufacturers (WI)	-	9	9	9	9	9	8	7
Number of UK commercial vehicle (CV) manufacturers	-	10	10	9	9	9	9	9
Number of cars and CVs produced (million)	1.98	1.81	1.69	1.82	1.85	1.86	1.80	1.65
New car registrations (AC) (million)	2.19	2.22	2.45	2.56	2.58	2.57	2.44	2.34
Cars and light CVs on the road (million)	29.50	29.90	30.50	31.30	31.90	32.40	32.90	34.24

<b>Appendix Table 2. Production and distribution inputs</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Total combined energy use (GWh) (AS)	6,110	7,013	6,857	6,540	6,126	5,337	5,104	4,851
Energy use per employee (kWh) (AS)	64,175	70,108	71,166	74,685	69,912	69,923	70,559	64,007
Energy use per £1million turnover (kWh) (AS)	303,828	309,717	281,036	186,943	156,419	154,062	129,602	115,847
Energy use per vehicle produced (MWh/unit) (VMS)	3.1	3.9	4.3	4	2.8	2.5	2.3	2.5
Total combined water use ('000m <sup>3</sup> ) (AS)	-	9,620	10,105	9,108	8,404	7,037	7,127	6,779
Water use per employee (m <sup>3</sup> ) (AS)	-	96.2	104.9	101.8	95.9	92.2	98.5	89.4
Water use per £1million turnover (m <sup>3</sup> ) (AS)	-	457	414	255	215	203	181	162
Water use per vehicle produced (m <sup>3</sup> ) (VMS)	-	5.3	6.2	5.6	3.4	3.4	3.2	3.3

<b>Appendix Table 3. Production and distribution material outputs</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Total combined CO <sub>2</sub> equivalent (tonnes) (AS)	1,821,586	2,182,926	2,149,771	1,954,295	1,679,832	1,447,900	1,417,129	1,363,189
CO <sub>2</sub> equivalent per employee (tonnes) (AS)	19.3	21.8	22.3	23.9	19.2	19.0	19.6	18.0
CO <sub>2</sub> equivalent (tonnes) per £1million turnover (AS)	90.6	95.3	88.1	59.9	42.9	41.8	36.0	32.6
CO <sub>2</sub> equivalent per vehicle produced (tonnes) (VMS)	1.1	1.1	1.3	1.2	0.7	0.7	0.6	0.7
Total combined emissions of VOC (kg) (AS)	4,018,951	7,136,682	6,926,340	6,240,100	7,336,780	5,479,870*	6,478,430	5,040,170
Emissions of VOC per employee (kg) (AS)	42.2	71.3	71.9	69.7	83.7	71.8	89.6	66.5
Emissions of VOC per £1million turnover (kg) (AS)	199.8	339.0	284.0	174.6	187.4	158.2	164.5	120.4
Emissions of VOC per vehicle produced (kg) (VMS)	2.9	4.4	4.6	4.2	4.1	3.5	3.5	2.9
Total combined waste to landfill (tonnes) (AS)	54,954	80,399	121,207	70,897	56,743	52,842	44,910	39,862
Waste to landfill per employee (tonnes)(AS)	0.6	0.8	1.3	0.8	0.6	0.7	0.6	0.5
Waste to landfill per £1million turnover (tonnes) (AS)	2.7	3.7	4.9	2.0	1.4	1.5	1.1	1.0
Waste to landfill per vehicle produced (kg) (VMS)	-	40.3	66.4	40.5	17.9	19.8	14.5	17.0
Total combined site waste for recycling (tonnes) (AS)						145,797	197,752	207,832
Site waste for recycling per employee (kg) (AS)						1,910.2	2,733.8	2,742.2
Site waste for recycling per £1million turnover (kg) (AS)						4,208.7	5,021.4	4,963.3
Site waste for recycling per vehicle produced (kg) (VMS)						78.2	99.7	108.2
Total combined site waste for recovery (tonnes) (AS)						3,373	2,506	1,566
Site waste for recovery per employee (tonnes) (AS)						0.0	0.0	0.0
Site waste (tonnes) for recovery per £1million turnover						0.1	0.1	0.0
Site waste (kg) for recovery per vehicle produced (VMS)						2.2	1.5	0.9
* Large vehicle manufacturer excluded from 2004 data								

<b>Appendix Table 4. Economic indicators</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
UK automotive manufacturing sector turnover (£ billion) (WI)	44.2	42.5	42.6	44.6	46.0	46.2	47.6	48.5
<b>Signatories combined turnover (£ billion) (AS)</b>	<b>20.1</b>	<b>21.0</b>	<b>24.4</b>	<b>35.7</b>	<b>39.2</b>	<b>34.6</b>	<b>39.4</b>	<b>41.9</b>
Total UK number of new cars produced (AC)	1,799,004	1,641,452	1,492,365	1,629,744	1,657,558	1,646,750	1,595,697	1,442,085
Total UK number of new CVs produced	185,905	172,442	192,872	191,267	188,871	209,293	206,753	207,704
<b>Total UK number of new vehicles produced</b>	<b>1,984,909</b>	<b>1,813,894</b>	<b>1,685,237</b>	<b>1,821,011</b>	<b>1,846,429</b>	<b>1,856,043</b>	<b>1,802,450</b>	<b>1,649,789</b>
<b>Total number of new vehicles produced by signatories</b>		<b>1,572,642</b>	<b>1,470,659</b>	<b>1,441,794</b>	<b>1,731,894</b>	<b>1,614,981</b>	<b>1,769,810</b>	<b>1,897,921</b>
Total number of new car registrations (AC)	2,197,615	2,221,647	2,458,769	2,563,631	2,579,050	2,567,269	2,439,717	2,344,864
Total number of new CV registrations	288,100	298,043	313,411	322,258	363,687	389,923	385,969	386,968
<b>Total number of new vehicle registrations</b>	<b>2,485,715</b>	<b>2,519,690</b>	<b>2,772,180</b>	<b>2,885,889</b>	<b>2,942,737</b>	<b>2,957,192</b>	<b>2,825,686</b>	<b>2,731,832</b>

<b>Appendix Table 5. Employment indicators</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Number of jobs dependent on the sector	910,600	891,700	883,200	873,100	877,100	854,400	861,600	851,800
· Automotive manufacturing	260,600	251,700	238,200	235,100	224,100	212,400	200,600	190,800
· Automotive supply and use	650,000	640,000	645,000	638,000	653,000	642,000	661,000	661,000
<b>Signatories total combined employees (AS)</b>	<b>95,214</b>	<b>100,036</b>	<b>96,357</b>	<b>89,455</b>	<b>87,625</b>	<b>76,327</b>	<b>72,337</b>	<b>75,789</b>

Data in the report is quoted in a number of ways:

Whole industry data	(WI)
All car sales in the United Kingdom	(AC)
SMMT members data	(SMMT)
All signatories	(AS)
Vehicle manufacturing signatories	(VMS)

# References

- (1) Sustainable resource use in the motor industry: a mass balance approach. Elghali, McColl-Grubb, Schiavi and Griffiths TRL 2004
- (2) Life cycle inventory for the Golf A4. Schweimer and Levin (2000)
- (3) Life Cycle Assessment of Lightweight and End-of-Life Scenarios for Generic Compact Class Passenger Vehicles. Wulf-Peter Schmidt, Elisabeth Dahlqvist, Matthias Finkbeiner, Stephan Krinke, Silvia Lazzari, Dirk Oschmann, Sophie Pichon and Christian Thiel (2004)
- (4) Stern Review of the Economics of Climate Change (2006)
- (5) <http://environment-agency.gov.uk/ourviews/857198/1498962/?lang=e>
- (6) LCVP Label, Research Programme 2007– ESA Market Research
- (7) [www.dft.gov.uk/pgr/roads/environment/rtfo/aboutrtfo](http://www.dft.gov.uk/pgr/roads/environment/rtfo/aboutrtfo)
- (8) ACEA, Improving Air Quality: a key interest
- (9) Defra, The air quality strategy for England, Scotland, Wales and Northern Ireland
- (10) Department for Transport, Transport Statistics Great Britain
- (11) [www.dft.gov.uk/pgr/sustainable/smarterchoices/](http://www.dft.gov.uk/pgr/sustainable/smarterchoices/)
- (12) HM Government- Securing the future– delivering UK sustainable development strategy

# Contact information

<b>Organisation</b>	<b>Website</b>	<b>Organisation</b>	<b>Website</b>
Auto Industry	<a href="http://www.autoindustry.co.uk">www.autoindustry.co.uk</a>	Sector Skills Council for the Automotive Sector	<a href="http://www.automotive-skills.org.uk">www.automotive-skills.org.uk</a>
The National Skills Academy	<a href="http://www.manufacturing.nscademy.co.uk">www.manufacturing.nscademy.co.uk</a>	SMMT	<a href="http://www.smmt.co.uk">www.smmt.co.uk</a>
Department for Food Environment and Rural Affairs	<a href="http://www.defra.gov.uk/environment/sustainable">www.defra.gov.uk/environment/sustainable</a>	Sustainable Development Research Network	<a href="http://www.sd-research.org.uk">www.sd-research.org.uk</a>
Department for Transport (DfT)	<a href="http://www.dft.gov.uk">www.dft.gov.uk</a>	The Carbon Trust	<a href="http://www.thecarbontrust.co.uk">www.thecarbontrust.co.uk</a>
Department for Business, Enterprise and Regulatory Reform	<a href="http://www.berr.gov.uk/">www.berr.gov.uk/</a>	The Sustainable Development Commission	<a href="http://www.sd-commission.org.uk">www.sd-commission.org.uk</a>
EC Sustainable Development	<a href="http://www.europa.eu.int/comm/sustainable">www.europa.eu.int/comm/sustainable</a>	The World Business Council for Sustainable Development	<a href="http://www.wbcsd.org">www.wbcsd.org</a>
Energy Savings Trust	<a href="http://www.transportenergy.org.uk">www.transportenergy.org.uk</a>	UK Climate Change Impact Programme	<a href="http://www.ukcip.org.uk">www.ukcip.org.uk</a>
Environment Agency	<a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a>	UK Commission for Integrated Transport	<a href="http://www.cfit.gov.uk">www.cfit.gov.uk</a>
European Environment Agency	<a href="http://www.eea.eu.int">www.eea.eu.int</a>	UK GOV SITE	<a href="http://www.sustainable-development.gov.uk">www.sustainable-development.gov.uk</a>
Foresight Vehicle Programme	<a href="http://www.foresightvehicle.org.uk">www.foresightvehicle.org.uk</a>	UN Division for Sustainable Development	<a href="http://www.un.org/esa/sustdev">www.un.org/esa/sustdev</a>
LowCVP	<a href="http://www.lowcvp.org.uk">www.lowcvp.org.uk</a>	United Kingdom Petroleum Industries Association	<a href="http://www.ukpia.com">www.ukpia.com</a>
Royal Society for the Prevention of Accidents	<a href="http://www.rospa.org.uk">www.rospa.org.uk</a>	Vehicle Certification Agency	<a href="http://www.vca.gov.uk">www.vca.gov.uk</a>

Published by:

The Society of Motor Manufacturers and Traders Limited., September 2006. SMMT and the SMMT Logo are registered trademarks of SMMT Ltd.

© All rights reserved

Printed on chlorine-free paper, manufactured from pulp sourced from sustainable sources.

Images from [www.freefoto.com](http://www.freefoto.com), [www.dreamtime.com](http://www.dreamtime.com)



**Signatory****Website**

Bentley Motors

[www.bentleymotors.com](http://www.bentleymotors.com)

BMW Group

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

Daimler Chrysler

[www.daimlerchrysler.com](http://www.daimlerchrysler.com)

Ford Motor Company

[www.ford.com](http://www.ford.com)

GKN Driveline

[www.gknplc.com](http://www.gknplc.com)

Honda UK Manufacturing

[www.mfg.honda.co.uk](http://www.mfg.honda.co.uk)

Jaguar Cars

[www.jaguar.com](http://www.jaguar.com)

Land Rover UK

[www.landrover.com](http://www.landrover.com)

Nissan

[www.nissan.co.uk](http://www.nissan.co.uk) and [www.nissan-global.com](http://www.nissan-global.com)

Perkins Engines

[www.caterpillar.com](http://www.caterpillar.com)PSA Peugeot Citroën  
Automobiles[www.sustainability.psa-peugeot-citroen.com](http://www.sustainability.psa-peugeot-citroen.com)

Toyota

[www.toyotauk.com](http://www.toyotauk.com) and [www.toyota.co.jp](http://www.toyota.co.jp)

Vauxhall Motors

[www.vauxhall.co.uk](http://www.vauxhall.co.uk)

Volvo Car UK

[www.volvocars.co.uk](http://www.volvocars.co.uk)

Volkswagen Group

[www.volkswagen-environment.de](http://www.volkswagen-environment.de)

Look for links to 'about us' or 'company' to be directed to sustainability and environmental information.



**The Society of Motor Manufacturers and Traders  
Forbes House, Halkin Street, London, SW1X 7DS UK  
Telephone: +44 (0)20 7344 9200 E-mail: [sustainability@smmt.co.uk](mailto:sustainability@smmt.co.uk)  
Website: [www.smmt.co.uk/sustainability](http://www.smmt.co.uk/sustainability)**

