

# Our plan for Sustainability

Jaguar Land Rover Sustainability Report 2009/2010



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## About this report

Welcome to Jaguar Land Rover's first combined sustainability report. This builds on the brand-specific reports published by Land Rover in 2008 and Jaguar Cars Limited in 2010.

Here we outline our commitment and approach to sustainability, provide information on our performance on key social and environmental issues, and set out our goals at a corporate level. Case studies and examples throughout the report offer insight into how these are put into practice across the company and in the development and manufacture of both Jaguar and Land Rover vehicles.

We appreciate your views on this report and our performance. Please send your feedback to Jaguar at [jaguarsd@jaguar.com](mailto:jaguarsd@jaguar.com) or Land Rover at [lrsd@landrover.com](mailto:lrsd@landrover.com).

### Scope

The data in this report covers the 2009 calendar year unless otherwise stated. Social and environmental activities included within this report refer to 2009 and 2010.

The report covers Jaguar Land Rover operations at all our UK manufacturing and product development sites. It does not cover our joint venture assembly plants outside the UK where complete knock down (CKD) kits of Land Rover components are painted and assembled – currently four in total (in Kenya, Malaysia, Pakistan and Turkey).

We publish an index of conformance with the Global Reporting Initiative (GRI) indicators.

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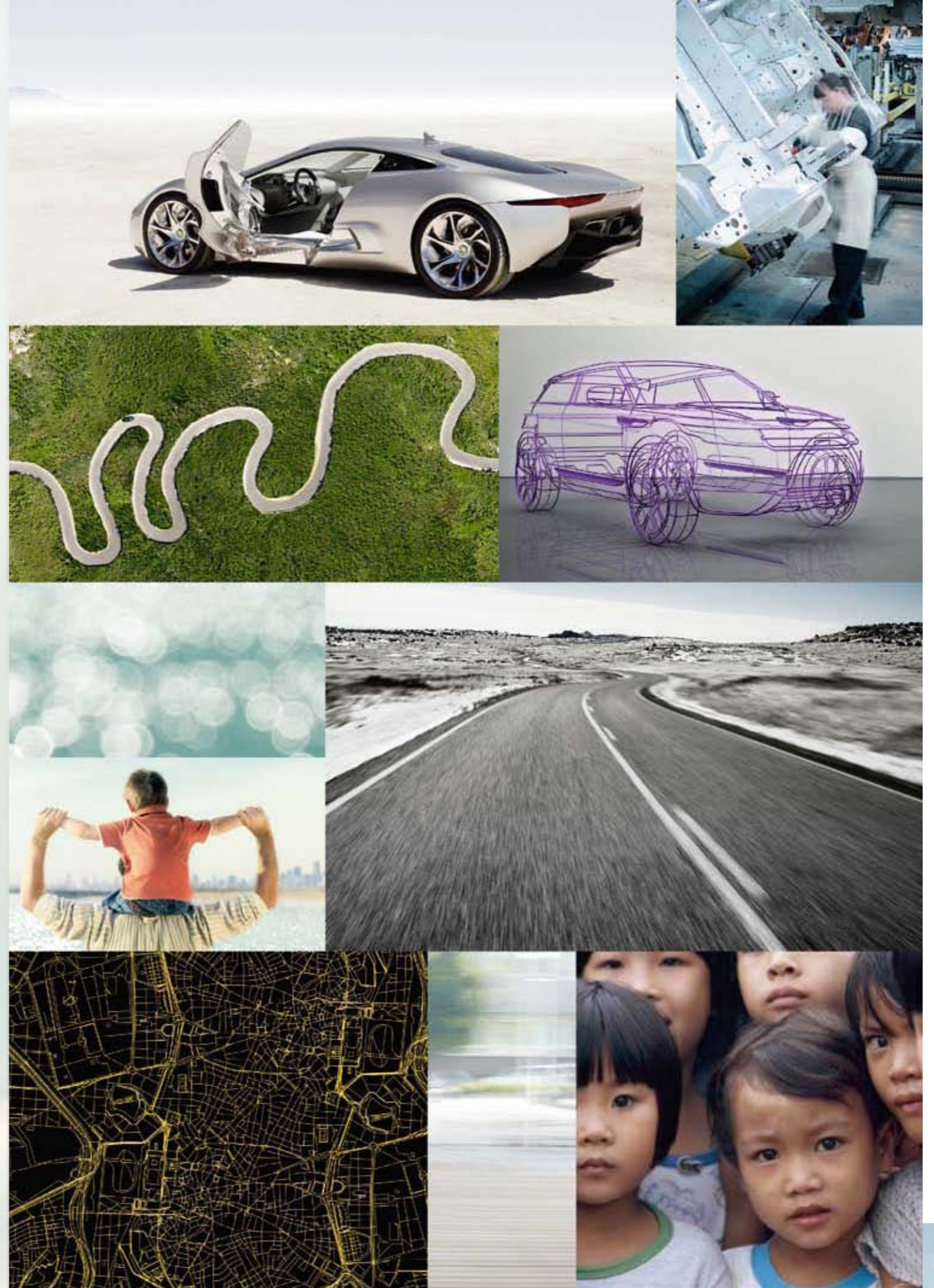


# About Jaguar Land Rover

Our business is built around two iconic British car brands. Jaguar Cars Limited, founded in 1922, is one of the world's premier manufacturers of luxury saloons and sports cars. Land Rover has manufactured four-wheel drive vehicles with the widest range of off-road capabilities since 1948.

With over £1 billion invested in product development each year, Jaguar Land Rover is at the centre of the UK automotive industry's efforts to develop innovative vehicle technologies. Our vehicles are designed, engineered and manufactured in the UK, and more than 70% of them are exported.

Jaguar Land Rover has been owned by Tata Motors Ltd since June 2008. We report our financial data in the Tata Motors Annual Report. See page 5 for a summary of our key financial data.





# Financial year

## April 2009 to March 2010

**Income**  
**£6,554m**

Sales of products and other income from operations

### Total Expenditure

**£6,122m**

**£747m**

Payments and provision  
for employees

**£4,389m**

Raw materials and components,  
purchase of products for sale

**£986m**

Manufacturing costs and  
other expenses

### Profit

**£432m**

before depreciation, interest,  
amortisation and tax

### Profit

**£3m**

for the financial period to March 2010

### Jaguar Cars Ltd. and Land Rover Regional volumes (no. vehicles)

North America **41,720**

Europe (excl. Russia) **50,584**

UK **57,056**

Russia **8,831**

China **17,004**

Rest of World **33,002**

### Jaguar Land Rover Global Sales Retail volumes (no. vehicles)

Jaguar Cars Ltd.  
**51,020**

Land Rover  
**157,177**

Total **208,197**



## Our products

### Jaguar

Our goal will always be to create beautiful, fast Jaguars – but also to find smarter, more sustainable ways to design and create them. Our latest generation of V6 diesel and V8 petrol engines deliver more power along with lower CO<sub>2</sub> emissions and better fuel economy than previous models.

- **XJ:** a luxury saloon that blends contemporary design with innovative technology and sustainability
- **XF:** combines the style and performance of a sports car with the space and sophistication of a luxury saloon
- **XK:** a grand tourer that combines performance with advanced technology and sporting luxury.

### Land Rover

For over 60 years, Land Rover has produced the finest all-terrain vehicles designed for performance and capability both on- and off-road. They are also built to last. Land Rover vehicles help the world's humanitarian aid and nature conservation workers reach remote and inaccessible regions.

- **Defender:** the original Land Rover – a dependable working vehicle, perfectly suited for crossing rough terrain in any conditions
- **Freelander 2:** an evolution of the compact four-wheel drive, offering versatility, flexibility and economy for buyers who need off-road capability as well as style
- **Discovery 4:** the latest iteration of the vehicle that expanded Land Rover's appeal beyond traditional four-wheel drive buyers into the leisure market. An all-terrain, seven-seater sports utility vehicle with style, functional design and state-of-the-art technology
- **The Range Rover:** the original luxury sports utility vehicle, combining saloon car performance, handling and comfort with typical Land Rover strength and all-terrain capability
- **Range Rover Sport:** refined on-road handling without compromising off-road capability
- **Range Rover Evoque:** the smallest, lightest and most fuel-efficient Range Rover ever, combining dynamic handling and advanced technology.

## Our operations

Jaguar Land Rover directly employs nearly 15,000 people, mainly in the UK. This includes around 3,500 engineers in our product development centres at our headquarters in Gaydon, Warwickshire, and at Whitley, Coventry.

- **Castle Bromwich, near Birmingham:** Jaguar XF, XJ and XK
- **Halewood, Merseyside:** Land Rover Freelander 2 and Range Rover Evoque
- **Solihull, West Midlands:** Land Rover Defender, Land Rover Discovery 4, Range Rover and Range Rover Sport.

Our business also supports around 115,000 more jobs indirectly among franchised dealerships, suppliers and local businesses near our sites. Vehicle sales are predominantly conducted through franchised dealerships worldwide, including 90 Jaguar and 118 Land Rover dealers in the UK.





## Introduction from Dr. Ralf Speth, CEO, Jaguar Land Rover



Welcome to the first Jaguar Land Rover Sustainability Report. In this report we highlight the significant achievements we have made in integrating corporate responsibility values into our business. It builds on the strengths of both Jaguar and Land Rover Brands which have previously reported separately.

Jaguar Land Rover's corporate positioning as One High Performance Company realises the power of two global brands and is driven by three passions:

- Designing great products,
- Create outstanding experiences for customers, and
- Environmental innovation.

Environmental Innovation is our approach to addressing the challenges of moving to a lower-carbon, sustainable world. There is no single technical solution and in this report we summarise our multi-faceted approach to sustainability management including many key research and development programmes aimed to improve the environmental performance of our vehicles. Over a five year period we are investing around £800 million in sustainability research and development to reduce our vehicle tailpipe CO<sub>2</sub> emissions.

It isn't only our vehicles that we are targeting and we apply the same philosophy to our operations. Across our UK facilities we have set ambitious targets, and by 2012 we aim to reduce our operating CO<sub>2</sub> emissions by 25%, waste to landfill by 25% and water consumption by 10%.

We are doing this because Jaguar Land Rover is a responsible business. Our long-term success is hugely important to the UK economy. We value our people – they are our greatest asset and key to our future. By the end of 2010 we will be employing over 18,000 people and indirectly our activities support in the region of 147,000 jobs. Jaguar Land Rover is one of the UK's most significant employers of engineers and plays a vital role in sustaining the nation's automotive technology expertise.

I am confident that everyone at Jaguar Land Rover will meet the challenges we face with a drive for excellence and innovation. This is a business that is built on two iconic brands - brands that with a continued focus on design, technology and quality will embrace and play a leading role in a sustainable future. There is still much to be done and I hope, after reading this report, you will be impressed by the progress Jaguar Land Rover is making.

A handwritten signature in black ink that reads "Ralf Speth". The signature is written in a cursive, flowing style.



# Our approach to sustainability

We believe that sustainability is fundamental to preserving the strong reputation of our brands, securing our licence to operate, delivering profitable growth, and retaining the trust of our stakeholders. It is integral to the way we work across the business.

As part of the wider automotive industry, we have a significant role to play in reducing the impacts and maximising the benefits of vehicle design and manufacturing. We are committed to doing everything we can to make our operations and our vehicles as sustainable as possible while maintaining the high quality our customers expect. Our focus is on reducing our carbon footprint, cutting material use and minimising waste.

Our biggest environmental impact is the tailpipe carbon dioxide (CO<sub>2</sub>) emissions created when our vehicles are used. We are investing £800 million in automotive environmental technologies to help reduce this. We have also made a £9 million commitment to make our own operations more energy efficient. We contribute to the skills and development of our people, and support our local communities as well as global conservation and humanitarian efforts.

In 2009, Jaguar Land Rover achieved Silver status in the Business in the Community (BITC) Corporate Responsibility Index for the second year running.



# Sustainable Development Policy

In 2010, we updated our Sustainable Development Policy to better reflect our goals and customers' increasing awareness about sustainability. The policy outlines our sustainability principles and commitments to society, the environment, customers and suppliers.



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## JAGUAR LAND ROVER SUSTAINABLE DEVELOPMENT POLICY

### Our Philosophy

At Jaguar Land Rover, sustainable development is integral to the way we work. It is a core value that drives the long-term success of our business. We believe that it is fundamental to preserving the strong reputation of our brands, securing our licence to operate, delivering profitable growth, and retaining the trust of all of our stakeholders.

### Our Principles

Jaguar Land Rover undertakes to act responsibly and ethically towards its employees, shareholders, customers, suppliers, dealers, and towards society and the environment – in every business operation across the world.

Jaguar Land Rover actively pursues industry-leading sustainable innovation across the whole product life cycle - from design and manufacture, to performance and disposal – to deliver products that benefit our customers and contribute to a more sustainable society.

Jaguar Land Rover is committed to securing its success by investing in its people and in research and development, actively managing its social and environmental impacts and planning for the transition towards a low carbon world.

Jaguar Land Rover's policy is to meet or exceed legal and regulatory requirements in all of its activities and demonstrate its accountability to stakeholders by periodically reporting on its performance in a transparent and open way.

### Our Commitments

#### Society:

We will positively engage with the local and global communities to ensure our presence adds value and brings benefits. Central to this is our commitment to the wellbeing and development of our employees and our support for social and humanitarian projects.

#### Environment:

We commit to continuously improving the environmental performance of our business and products by reducing emissions, conserving natural resources, and optimising the use of sustainable energy and materials. This is underpinned by our investment in research into cutting-edge environmental innovation.

#### Customers and products:

We declare our commitment to delivering exceptional products and services that meet the needs of our customers and promote and help enable the shift towards a low carbon society.

#### Suppliers:

We expect the highest standards of conduct and performance across our supply chain. We promote fairness and responsible business practice and encourage collaboration in the pursuit of sustainable solutions.

Ralf Speth  
Jaguar Land Rover  
November 2010

Jaguar Cars Limited: Registered Office:  
Abbey Road, Whitley, Coventry CV3 4LF.  
Registered in England No: 1672070.

Land Rover: Registered Office:  
Banbury Road, Gaydon, Warwick CV35 0RR, United Kingdom.  
Registered in England and Wales No: 4019301.





# Managing sustainability

At Jaguar Land Rover, ultimate responsibility for sustainability resides with our CEO, Dr. Ralf Speth, and the Board of Directors for each company. Sustainability issues are specifically represented by a Board-level committee, established in 2008. The committee meets monthly to review implementation of the sustainability strategy and our performance, identify any new risks and ways to manage them, and recognise any significant sustainability achievements by employees across the business.



Sustainability Governance Structure

The Board-level committee is supported by a Sustainability Action Group comprised of senior managers. Day-to-day sustainability management is the responsibility of the Corporate Sustainability and Compliance team. The team develops our sustainability policy and strategy and oversees implementation by employees in all business functions.

In 2009, we established a small group of senior managers responsible for integrating our new Environmental Innovation programme (see page 11) within each business function, and for making the necessary investments to help us meet our targets. The Board Champion for Environmental Innovation is Group Engineering Director, Bob Joyce.

## Identifying our material issues

We identify the existing and emerging sustainability issues that are most material to Jaguar Land Rover through our business planning process and a gap analysis of risks, opportunities and future sustainability trends.

We use our findings to plan activities designed to make our operations more sustainable, and identify metrics to monitor our progress against our commitments.

Based on our analysis, the most material sustainability issues for Jaguar Land Rover are:

- **Climate change:** reducing the carbon footprint of our business and our products
- **Resource management:** managing resources responsibly and working to eliminate materials of concern
- **Waste reduction:** eliminating waste in all areas of our business and making processes more resource-efficient
- **Employee engagement:** using the skills and talents of our employees to the fullest extent.

Engaging with stakeholders is also an important aspect of our sustainability management and we aim to develop effective relationships with them (see page 14).



# Environmental Innovation Strategy

Environmental Innovation (Ei) is vital for our future competitive advantage in a low-carbon world. We must minimise the environmental impact of our products and operations.

We have identified this as one of three core business drivers – along with designing great products and creating outstanding experiences for customers – that will enable us to achieve our full potential as a business (see diagram).

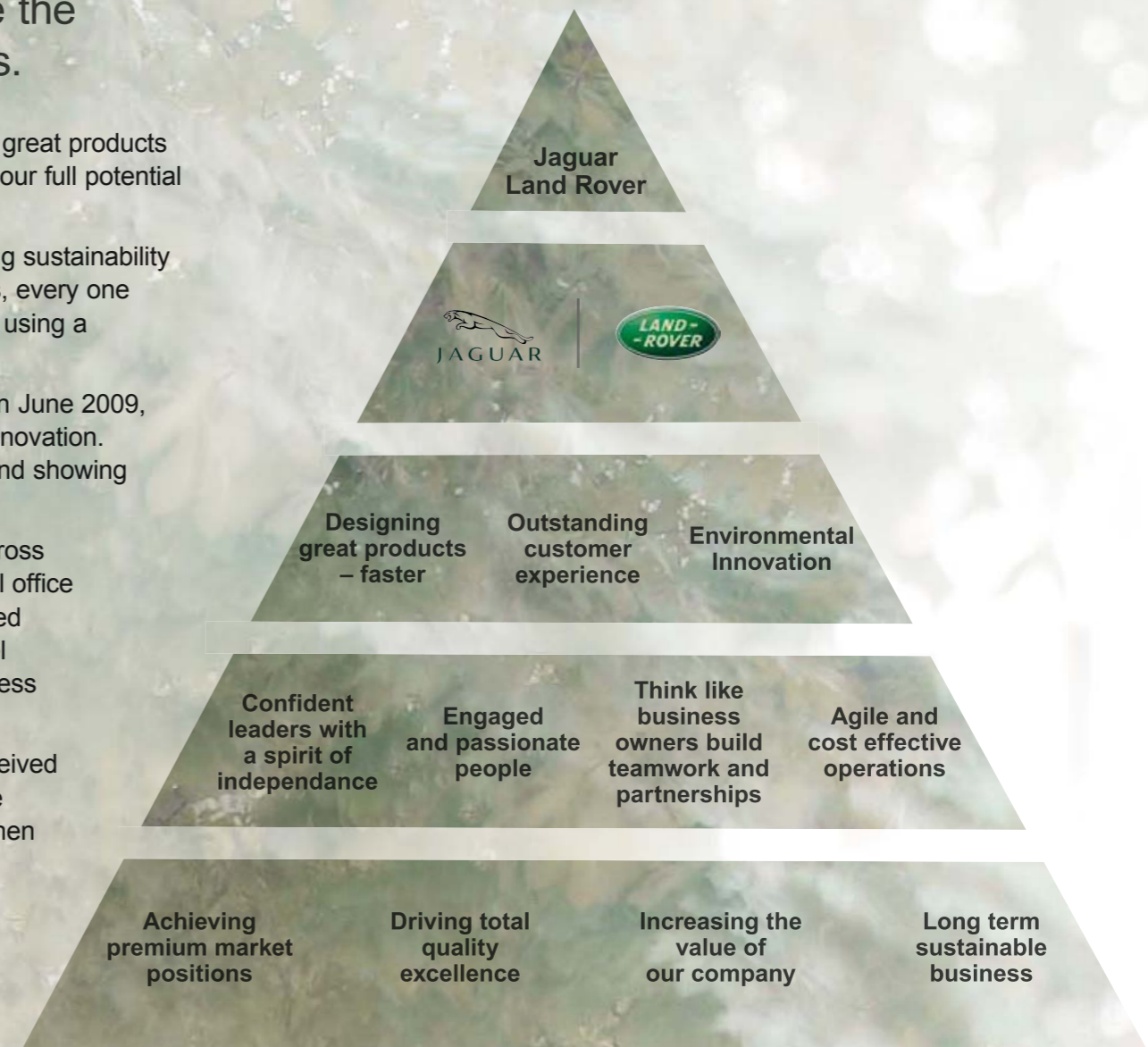
Our new Environmental Innovation strategy – part of our wider approach to managing sustainability – commits us to a series of stretching targets (see page 12). To achieve these goals, every one of our employees must play a part. We will measure progress towards these targets using a company-wide scorecard.

This new strategy was launched at the Jaguar Land Rover Leadership Conference in June 2009, when the company's top 150 leaders came together to learn about Environmental Innovation. Each of them was then responsible for training their teams by running a workshop and showing a DVD that highlights examples of progress towards the goals.

Since then we have communicated our Environmental Innovation strategy widely across Jaguar Land Rover through our intranet, email newsletters, notices and posters in all office and manufacturing buildings. Regular updates help to ensure employees are informed about our activities and performance. The new strategy is represented at Board level by an Environmental Innovation sponsor, responsible for raising the Board's awareness about the campaign and related initiatives.

As a result of this awareness campaign, all Jaguar Land Rover employees have received the information and training they need to help us achieve our targets. We encourage everyone to contribute however they can, from switching off lights and computers when not in use to designing innovative environmental technologies.

Certain employees, such as those with responsibility for environmental product development and operations' environmental performance, are tasked with playing a larger role in helping us achieve our Environmental Innovation targets. We assess their contribution as part of their annual performance review. Sustainability goals are also included in the criteria for executive remuneration where relevant.





# Environmental Innovation Strategy

## Strategic goal

Reduce EU fleet CO<sub>2</sub> to 120g/km by 2020

## Specific targets

**25%** reduction in EU fleet CO<sub>2</sub> by 2015

## Strategic goal

Reduce our business' environmental footprint by 25% by 2012

## Specific targets

**25%** reduction in operational CO<sub>2</sub> emissions by 2012

**25%** reduction in waste to landfill by 2012

**10%** reduction in water use by 2012



## Managing our carbon footprint

Emissions from vehicle use account for an estimated 85% of a car's carbon footprint throughout its lifecycle and reducing tailpipe emissions from our vehicles is a priority. A further 10% is from the production of the vehicle and the remaining 5% is from end-of-life impacts.

Within our operations (the 10% of emissions from production), site energy use represents the most significant impact, followed by transport of parts and vehicles. These are our two key focus areas for reducing our operational carbon footprint.

This footprint does not include emissions from our supply chain, except transport of parts and products by third party logistics suppliers. We are working with key suppliers to assess and reduce emissions (see pages 48 and 49).

## Our carbon management strategy

Our integrated carbon management strategy has three key elements:

1. Reducing tailpipe CO<sub>2</sub> emissions from our vehicles (see pages 18 and 24)
2. Reducing our operational footprint from site energy use, transport of parts and products, and business travel (see pages 39 - 50)
3. Offsetting CO<sub>2</sub> emissions while we develop lower emission vehicles and more efficient manufacturing processes (see page 34).

Energy use  
at manufacturing and  
development sites  
**256,000**  
tonnes

Outbound  
freight  
**38,831**  
tonnes

Inbound  
freight  
**33,809**  
tonnes

Business  
vehicle travel  
**6,779**  
tonnes

Business  
air travel  
**1,819**  
tonnes

An estimated 85%  
of our CO<sub>2</sub> emissions  
are from our vehicles  
during use



## Stakeholder Engagement

We engage with a wide variety of stakeholders, including governments, industry associations, trade organisations, non-governmental organisations (NGOs), employees, local communities, and customers.

Dialogue with these groups enables us to understand their expectations, keep track of sustainability trends in the automotive industry, and communicate our position on pertinent issues.

Jaguar Land Rover is a signatory of the UK automotive sector strategy for sustainable development, developed by the Society of Motor Manufacturers and Traders (SMMT). We worked with the SMMT to identify the challenges that achieving sustainable mobility presents to the motor industry. Together we highlighted the need for an integrated approach to sustainable mobility, through cooperation between industry, the government and customers.

We continue to work with sustainable development charity Forum for the Future, a partnership that began in 2000. Forum provides us with advice and guidance, and helped us formulate our long-term sustainability vision and action plan.

Jaguar Land Rover is a member of Business in the Community – an organisation which aims to encourage companies to continually improve their impact on society – and take part in its Corporate Responsibility Index and Community Mark to benchmark our performance on community, environment, workplace and marketplace.

We have long-term partnerships with local and regional educational authorities supporting our commitment to science, technology, engineering and maths (see page 61 and 62). Communicating with customers about sustainability is also an important element of our stakeholder engagement (see page 33).



# Business ethics

We are committed to acting honestly, ethically and with integrity. All Jaguar Land Rover employees must act in a way that upholds our Business Principles, and must comply with our Code of Conduct and all applicable legislation.

## Business Principles

Our Business Principles, adopted in 2005, create a framework of corporate values that guide our decisions and actions globally. They set the standards by which we judge ourselves as a company, and by which we hope to be judged by others.

## Our Business Principles are:

### *Accountability*

We will be honest and open, and model the highest standards of corporate integrity.

We will achieve this by:

- Being responsive to stakeholders' concerns on the impact of our operations, products and services through public disclosure and regular reporting
- Making accurate and forthright statements, competing ethically, avoiding conflicts of interest and having zero tolerance for the offer, payment, solicitation or acceptance of bribes.

### *Community*

We will respect and contribute to the communities around the world in which we work.

We will achieve this by:

- Respecting and supporting, in line with the legitimate role of business, the basic human rights of all people within our businesses and throughout our entire value chain
- Being sensitive to, and engaging in, the cultures of the communities in which we participate
- Making responsible and mutually beneficial investment in the communities we serve.

### *Environment*

We will respect the natural environment and help preserve it for future generations.

We will achieve this by:

- Working to provide effective environmental solutions
- Working to continuously reduce the environmental impacts of our business, in line with our commitment to contribute to sustainable development
- Measuring, understanding and responsibly managing our resource use, especially materials of concern and non-renewable resources
- Working to eliminate waste.

### *Financial health*

We will make our decisions with proper regard to the long-term financial security of the company.

We will achieve this by:

- Striving to create value for our shareholders that is sustainable over the long term
- Seeking enhanced stakeholder loyalty as a route to competitive advantage and long-term growth.



### **Products and customers**

We will offer excellent products and services.

We will achieve this by:

- Focusing on customer satisfaction and loyalty, and keeping our promises
- Using our understanding of the market to anticipate customers needs
- Delivering innovative products and services that offer high value in terms of function, price, quality, safety and environmental performance.

### **Quality of relationships**

We will strive to earn the trust and respect of our investors, customers, dealers, employees, unions, business partners and society.

We will achieve this by:

- Building and maintaining a caring culture of partnership and mutual benefit
- Developing individual and team skills so employees may reach their full potential and contribute to the success of the company
- Creating a business climate that encourages innovation, learning and exceptional performance
- Actively pursuing the benefits derived from a diverse workforce, as well as those from the diversity of perspectives provided by our stakeholders.

### **Safety**

We will strive to protect the safety and health of those who make, distribute or use our products.

We will achieve this by:

- Working to create the safest possible workplace
- Striving to continuously reduce the risk of accidents, injuries and fatalities involving our products
- Striving to protect people and property.

## **Code of Conduct**

The Jaguar Land Rover Code of Conduct is designed to ensure that all employees behave in a way that protects – and, where possible, enhances – our reputation. It also applies to third parties instructed to act on our behalf, including consultants, temporary workers and dealers.

The Code of Conduct provides a summary of relevant legal requirements and our core policies on: interactions with employees, customers, suppliers, dealers, government agencies and others; conflicts of interest; use of company assets; privacy and data protection.

Each year, we ask every Jaguar Land Rover employee to certify that he or she has read, understood and complies with the Code of Conduct.

## **Whistleblowing**

We monitor compliance with our Code of Conduct and respond appropriately when breaches occur.

Employees have a duty to promptly report any actions they believe may break the law or violate our Code of Conduct. Employees can report incidents to their manager, or the compliance or human resources departments. Alternatively they can call a free, confidential helpline or complete an incident reporting form on the company intranet.

We assure employees that there will not be any reprisal against those who file reports in good faith, even if they are not certain a violation has occurred.

Jaguar Land Rover thoroughly investigates all reports and responds appropriately to each incidence of non-compliance. Anyone found to be in breach of the law or our Code of Conduct may be subject to disciplinary action, including dismissal in the most serious cases.

# Responsible products

Jaguar and Land Rover products are renowned for performance and luxury. That does not mean they need to have an excessive environmental footprint.

We are fully engaged in applying the same flair for engineering innovation on which our reputation is built to solving environmental challenges, most pressing of which is the carbon footprint of our vehicles. We have over 100 engineers working on a five-year, £800 million sustainability research and development programme.

Our immediate goal is to meet the tightening regulatory targets for reducing tailpipe CO<sub>2</sub> emissions predominantly led by the EU and US markets. These targets are based on our average fleet sales which for the EU equates to a 25% reduction from our 2007 position over the 2012 to 2015 period. We are confident that we will achieve both the EU and equally challenging US legislative requirements as well as continuing our progress towards an anticipated 50% reduction in the EU by 2020.

## A focus on the whole life cycle

We are not just concerned with tailpipe CO<sub>2</sub> although this accounts for approximately 80% of the lifecycle carbon footprint. We recognise the many environmental impacts at all stages of the vehicle lifecycle, from raw materials to end of life. To gain a fuller understanding of these we have developed the capability in-house to undertake lifecycle assessments (LCA) that quantify the main environmental impacts at each stage of the vehicle's life from cradle to grave.

The new Jaguar XJ was our first vehicle fully assessed in this way using the international standard methodology for conducting LCA, ISO14040. The Range Rover Evoque was our second model to complete this assessment. We use this analysis to understand how to reduce the environmental impact at each stage of vehicle design, build, use, and end-of-life.





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

It requires cutting edge technological innovation to achieve low CO<sub>2</sub> levels without compromising on performance or luxury. These are the hallmarks of Jaguar Land Rover's products and our engineers are engaged in a series of major leading-edge research and development projects targeting lower CO<sub>2</sub> while maintaining the standards our customers expect.

### Jaguar Land Rover EU Fleet average tailpipe CO<sub>2</sub> emissions

**2006** 243 g/km CO<sub>2</sub>

**2007** 240 g/km CO<sub>2</sub>

**2008** 236 g/km CO<sub>2</sub>

**2009** 228 g/km CO<sub>2</sub>

**2015** <175 g/km CO<sub>2</sub>

#### LAND ROVER

2010 Calendar Year	Fuel	g/km
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#### DEFENDER

2.4L (110)	Diesel	295
2.4L (90)	Diesel	266

#### FREELANDER 2

2.2L TD4 4WD Auto	Diesel	185
2.2L TD4 4WD Manual	Diesel	165
2.2L eD4 2WD Manual	Diesel	159

#### DISCOVERY 4

3.0L TDV6	Diesel	244
5.0L V8	Petrol	328

#### RANGE ROVER SPORT

3.0L TDV6 Auto	Diesel	246
5.0L V8 Auto	Diesel	327
5.0L V8 Supercharged Auto	Petrol	348

#### THE RANGE ROVER

4.4L V8 Auto	Diesel	253
5.0L V8 Auto	Petrol	326
5.0L V8 Supercharged Auto	Petrol	348

#### JAGUAR

2010 Calendar Year	Fuel	g/km*
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#### XJ

3.0L V6	Diesel	184
5.0L V8	Petrol	264
5.0L V8 Supercharged	Petrol	289

#### XF

3.0L V6	Petrol	249
3.0L V6	Diesel	179
5.0L V8	Petrol	264
5.0L V8 Supercharged	Petrol	292

#### XK

5.0L	Petrol	264
5.0L Supercharged	Petrol	292

\*New European Drive Cycle

## Improvements up to 2012

The development time for a new vehicle is typically 3.5 years from concept to launch. Consequently, we already have a plan for the products we will be making up to 2013. Beyond that date there are significant variables depending on the technologies that show the most promise and market factors.

EU regulation requires that in the period 2012 to 2015 we reduce our fleet average tailpipe CO<sub>2</sub> emissions by 25% compared with the 2007 figure. In the short term we will work towards achieving this in four main ways:

1. The introduction of the Range Rover Evoque in 2011. With the most efficient version of the all new Evoque model range achieving 129g/km, the Evoque will have a significant beneficial impact on our fleet average emissions (see case study).
2. Introducing Intelligent Power System Management (IPSM) that delivers a 2-3% emissions reduction by managing the alternator and battery charge cycle. The system charges the battery when the vehicle is decelerating and avoids doing so when accelerating, thereby reducing the load on the engine. IPSM was launched on all 2010 model vehicles (Jaguar XF, XK and Range Rover Sport and Discovery 4). IPSM will be launched on the Jaguar XJ in 2011 and the Land Rover Freelander 2 in late 2010.
3. Increasing use of lightweight components, especially aluminium for bodies and castings. The Jaguar XK and XJ ranges already feature aluminium monocoque bodies and the Range Rover Evoque has an aluminium bonnet, roof panels and some suspension components.
4. Refinements to existing technology to reduce losses and extensions to our product range to offer smaller capacity, more efficient powertrains.

## Improvements up to 2015

Stop/Start is a significant technological advance that we will introduce to more models between 2012 and 2015. This cuts CO<sub>2</sub> emissions by approximately 3.5% in manual vehicles and 7% in automatics by stopping the engine at idle, for example at traffic lights. We are introducing Stop/Start to manual vehicles first because more complex technology is required to make the system work in automatic vehicles.

The first Land Rover to have intelligent Stop/Start was the Freelander 2 diesel manual launched in 2009, followed by the Evoque diesel manual in 2011 (the automatic version will be available in 2013). By 2015, 80% of all Jaguar Land Rover models will incorporate intelligent Stop/Start technology.

Our light-weighting programmes will continue across our range with the complete Jaguar range based on aluminium bodies by 2015.





## Next generation propulsion systems beyond 2015

Jaguar Land Rover is actively pursuing a range of hybrid and electric vehicles. More than 100 engineers are now working specifically on hybrid technologies that include diesel and petrol hybrids, plug-in hybrids and range extended hybrids. Our investment of £800 million in product sustainability research and development over five years is the largest ever in UK manufacturing.

Land Rover plans to introduce our first diesel hybrid in 2013 subject to market factors, technology testing and commercial considerations.

Our strategy is to partner with leading technology organisations to give our research and development investment the highest chance of success and the quickest route to incorporation in our vehicles. These include specialist companies in our supply chain, and academic and research organisations. A number of key projects are supported by the Technology Strategy Board, the Government's Innovation Agency, and the Department for Transport, through the Low Carbon Vehicles Innovation Platform.

The key projects in Jaguar Land Rover's research and development pipeline are:

### Limo-Green

Based on the new lightweight XJ saloon launched in 2010, Limo-Green is a 'range extended electric vehicle'. Limo-Green had a target to produce CO<sub>2</sub> emissions of less than 120g/km but is expected to deliver less than 80g/km CO<sub>2</sub> with a top speed of 180kph, 0 to 100kph in 7.9 seconds, a range of 800km and 48km in electric vehicle (EV) mode.

#### Technical spec:

Target CO<sub>2</sub> emissions < 120 g/km, (predicted <80g/km)

Range > 800km

EV range 31km

Top speed 180kph

Acceleration 0 to 100kph 7.9 seconds





# REHEV

## Range Extended Electric Hybrid Vehicle (REHEV)

The REHEV project is the world's first ever plug-in hybrid powering a premium SUV. A Range Rover Sport development vehicle was adapted to research a plug-in diesel electric parallel hybrid system suitable for a range of applications.

The REHEV runs as a pure electric car for up to 30km in town and the diesel engine and electric motor combine to drive all four wheels at higher speeds and when off-road. The project investigated range extension and plug-in charging and the installation of local recharging facilities. REHEV achieved emissions of 94g/km over the drive cycle, a significant improvement on the already ambitions target of 130g/km.

### Technical spec:

CO<sub>2</sub> emissions 94 g/km

Range > 483km

EV range 30km

## range\_e

By the end of 2010, building upon the REHEV project Land Rover will be testing the first plug-in diesel hybrid prototype on the road. The range\_e vehicles being developed using a Range Rover Sport platform will use the existing 3.0 litre TDV6 diesel engine in conjunction with an eight-speed ZF automatic transmission. The goals are to achieve an EV range of 32km with certified emissions of less than 100g/km of CO<sub>2</sub>, and a top speed of around 193kph.

### Technical spec:

CO<sub>2</sub> emissions <100 g/km

Range > 483km

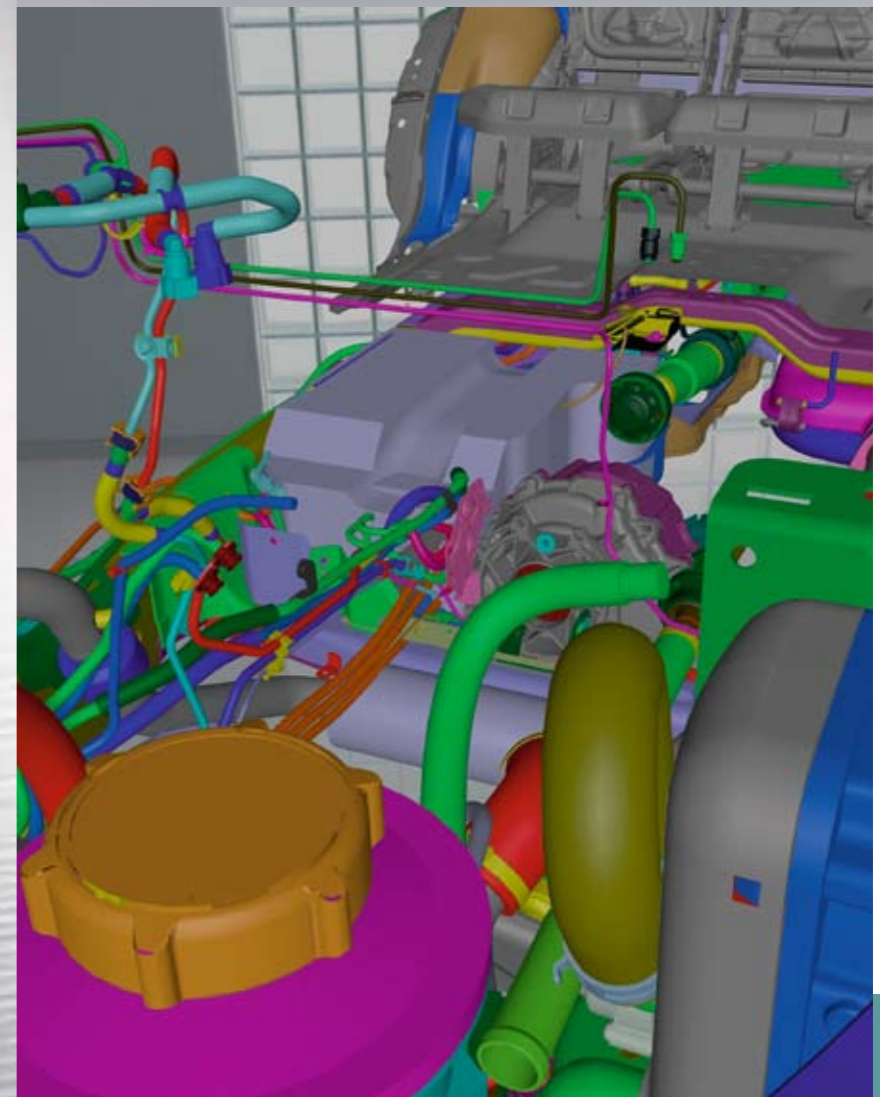
EV range 32km

Top speed 193kph

## SERV

SERV is a research project to develop flexi-diesel technology suitable for burning second generation biofuels. These are fuels made from plant wastes that do not compete for resources with food production.

Through this research Jaguar Land Rover is learning about the technology needed to allow diesel engines to accept a wide range of fuels including those made with significant percentages of second generation bio-fuels. Currently, diesel engines can handle 7% biodiesel and petrol engines can handle 10% bioethanol.



CGI image of the Range Extended Electric Hybrid Vehicle (REHEV) chassis



## Flywheel Hybrid System

The UK has a world-class cluster of pioneering companies developing flywheel technology systems that recover and store energy generated during braking. A lightweight composite flywheel spins at very high speed in a vacuum. The flywheel is connected to the vehicle by a continuously variable transmission that transfers energy back to the wheels under acceleration.

Jaguar Land Rover is closely involved in a Technology Strategy Board research project known as Flywheel Hybrid System for Premium Vehicles. The other project partners are Flybrid Systems, Torotrak, Prodrive, Xtrac, Ricardo and Ford Motor Company.

The project vehicle uses a mechanical flywheel hybrid system to demonstrate the feasibility and test the capabilities of the technology. Targeting a 15-20% reduction in CO<sub>2</sub> emissions, the project is investigating how the flywheel hybrid system behaves when integrated into a premium passenger vehicle. We believe the system has potential and we are now testing a prototype to validate this.

## Ultra lightweight body architecture

This project will demonstrate, within five years, the feasibility of a mass-produced lightweight car based on a body structure using aluminium sheet derived in part from recycled post-consumer scrap.

It has the potential to enable the mass production of cars emitting less than 100g/km of CO<sub>2</sub>.

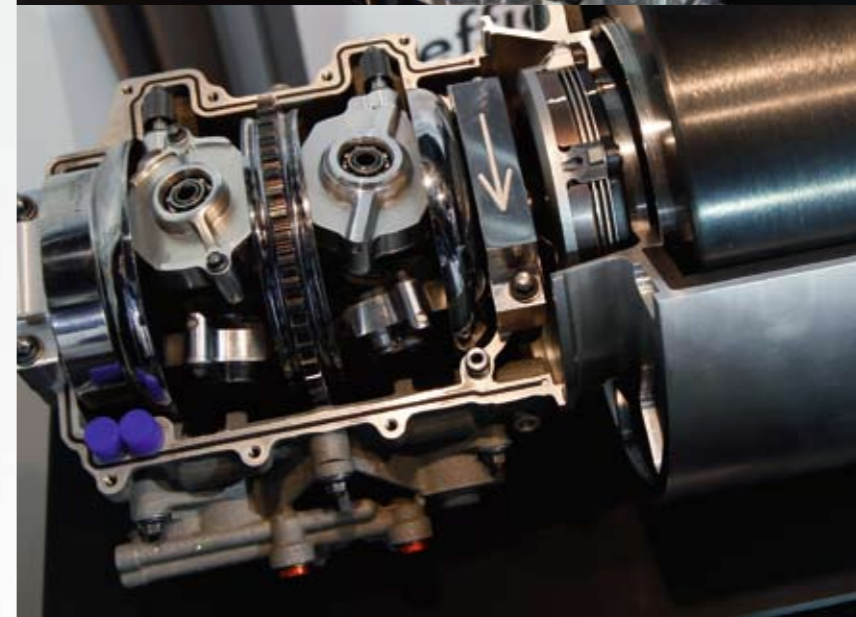
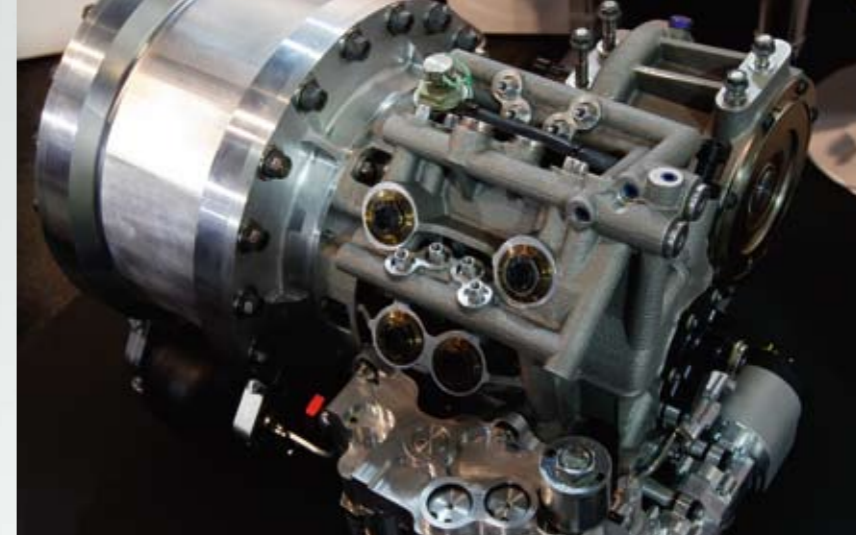
## Two stroke/four stroke switching technology

Jaguar Land Rover is involved in a project to deliver a global premium vehicle that uses an innovative, highly downsized petrol engine featuring two-stroke/four-stroke switching technology to reduce CO<sub>2</sub> emissions by 25-30% with no loss of performance.

## Ultra lightweight Range Extender

We are trialling powerful jet engine technology using micro gas turbines to power ultra low carbon performance cars. The turbine extends the vehicle range and is ultra-light weighing only 20kg per 50kW output. Conventional internal combustion engines weigh about 160kg per 50kW.

This visionary technology could be part of the powertrain of ultra-light high performance vehicles of the future.



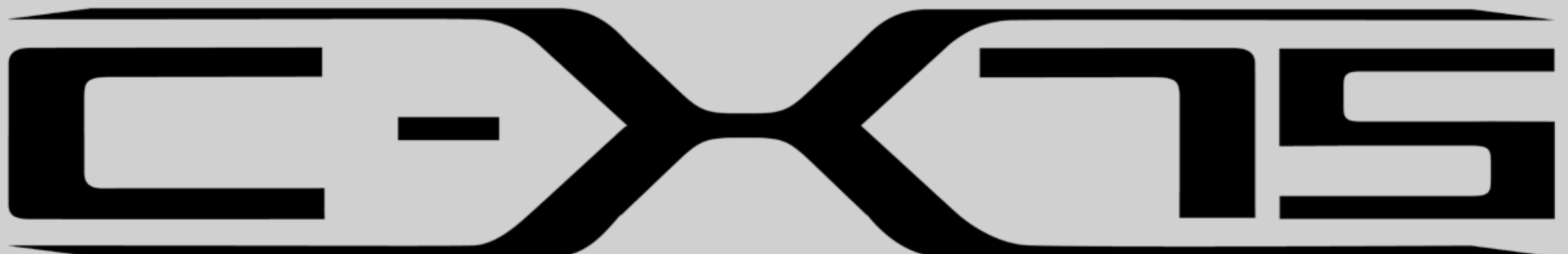
Images shown here are of the Flywheel Hybrid System

## Turbine – powered Jaguar C-X75 concept supercar

Imagine a supercar capable of 330kph (205mph) and accelerating to 100kph (62mph) in 3.4 seconds. Sounds like an environmentalist’s nightmare. But this vision of performance motoring is estimated to emit just 28g/km CO<sub>2</sub>.

The concept car is built from aluminium and carbon fibre and powered by an electric motor at each wheel. Each motor weighs just 50kg and produces a maximum 195bhp. The motors are supplied by batteries that give it an electric-only range of 110km. The concept’s most striking innovation is the inclusion of two micro-turbine jet engines developed with Bladon Jets. These are not used for thrust as in conventional jet engines, but instead charge the batteries extending the range to 900km and enabling the impressive performance figures.

Of course C-X75 is a concept at this point in time and cannot yet be driven. The first of many technical challenges is research into the function of the micro-turbine with the electricity generator. But Jaguar has looked to the future and shown how performance motoring may be compatible with a low-carbon society.





## Range Rover Evoque

The Range Rover Evoque, launched in Paris on 30th September 2010, sends a powerful message that Land Rover is serious about sustainability, and determined to deliver products that combine sustainability credentials with performance and desirability. The Evoque is the first Range Rover to undergo a lifecycle assessment to the ISO 14040 methodology.

Its greener credentials stem from a comprehensive approach to reducing environmental impact throughout the life-cycle of the car, including:

- **Whole-life approach** – focus on minimising the overall carbon footprint, from development and manufacturing, to customer use and end-of-life
- **Compact size** – the smallest and lightest Range Rover ever, with vehicle weights starting at just 1,600kg. This has helped the Evoque deliver lower tailpipe CO<sub>2</sub> emissions
- **Lightweight technologies** – advanced lightweight materials used throughout the body and chassis:
  - Aluminium hood and roof panels (saving 10kg)
  - Aluminium front lower control arms and front/rear suspension knuckles (saving 12kg)

- Plastic front fenders and tailgate assembly (saving 15.5kg)
- Magnesium cross car beam
- Optimised steel body structure with over 18% of boron/high Strength Steels in key load-bearing areas (saving 36kg)
- Plus: thinner windscreen with acoustic lamination; lightweight alloy wheels; optimised front subframe design; aluminium bumper beam; lighter wrapped instrument panel; lightweight laser-welded seat structure; and optimised insulation materials.

- **Efficient powertrain** – state-of-the-art petrol and diesel engines, with high-efficiency features like direct injection and stop/start:
  - Manual cars feature a stop/start function to reduce fuel consumption and CO<sub>2</sub> emissions by a further 3.5%.
  - For the ultimate in low carbon performance, customers can specify a 2WD car with a high-economy eD4 variant of the engine, to deliver sub-130g/km CO<sub>2</sub>.
- **Eliminating inefficiencies** – innovative technologies to minimise fuel economy, including Electric Power Assisted Steering (EPAS) and smart charging. In addition to the powertrain efficiency savings have been made in:

- Manual transmission – adoption of low viscosity transmission fluid
- Automatic transmission – gear train optimisation, advanced idle control, adoption of low viscosity transmission fluid
- Petrol and diesel engines – reduction of engine internal friction through low friction coatings
- Electrical system – smart regenerative charging system to capture wasted energy during vehicle deceleration to charge the battery
- Chassis – adoption of EPAS in place of a hydraulic system
- Tyres – optimisation of tyre rolling resistance
- Air conditioning – use of clutchless compressors
- Windscreen – use of mist sensing heated windscreen
- Body design – reduced aerodynamic drag through smaller frontal area and detailed optimisation.
- Introducing the 2WD – ultra-efficient eD4 diesel 2WD Coupé model delivers 129g/km CO<sub>2</sub> emissions (134g/km 5-door)
- Recycling and re-use – maximising the use of sustainable and recycled materials, plus optimising end-of-life recyclability





# Lighter materials with a smaller footprint

Lightweight Vehicle Architecture is one of the most effective ways to reduce tailpipe CO<sub>2</sub> emissions. Aluminium offers a 40% saving in weight over an equivalent steel body for the same strength.

For example, the Jaguar XJ is at least 150kg lighter than comparable competitor models. Reducing weight enables us to use smaller capacity engines while maintaining or improving performance.

Reducing vehicle weight is directly linked with reducing tailpipe CO<sub>2</sub> emissions, whether the vehicle is powered by petrol, diesel or a hybrid system. With today's powertrain technology, it is necessary to keep vehicle weight below about 1,000kg to achieve low tailpipe emissions of 100g CO<sub>2</sub>/km.

Jaguar Land Rover is already the automotive industry leader in volume aluminium manufacture and technology. However, we are not standing still. Our lifecycle assessments have illustrated the significant carbon footprint associated with manufacture of new aluminium. By comparison, recycled aluminium is 95% less carbon intensive so it makes sense to incorporate as high a percentage of recycled aluminium in our cars as possible.





# REALCAR, a project supported by the Technology Strategy Board, aims to increase the recycled content of the aluminium we use from less than 50% to 75% by 2012.

The chart shows lifecycle assessment results for 200,000km life-time use. The second bar illustrates the initial reduction in CO<sub>2</sub> equivalent (CO<sub>2</sub> eq) from switching from steel to aluminium with the same 3.0 litre powertrain. The third bar shows the bigger reduction achieved because the lighter body allows a smaller 2.2 litre powertrain to be used without loss of performance. The right hand bar shows the reduction in production emissions when the composition of the aluminium used is increased from 50% recycled to 75% – the REALCAR goal.

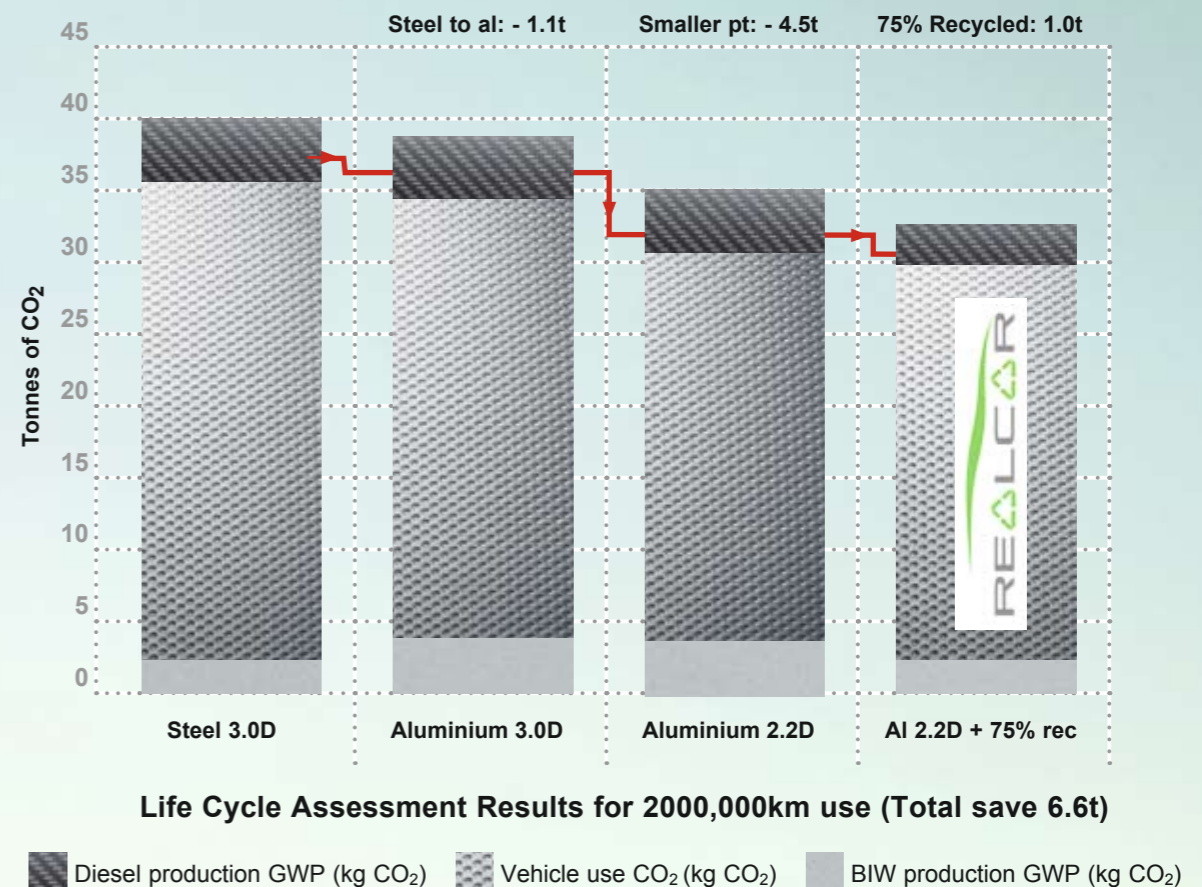
By switching from steel to aluminium, reducing the engine size to 2.2 litres and increasing the percentage of recycled aluminium to 75%, 6.6 tonnes of CO<sub>2</sub> eq could be saved – representing a 16.5% reduction in lifecycle CO<sub>2</sub> eq emissions. Further CO<sub>2</sub> eq savings can be achieved by reducing chassis and brake component weights as a consequence of the lower body and powertrain weight.

REALCAR is influencing the aluminium supply chain to capture more recycled material, with the cooperation of key players in the aluminium production and recycling industry. The project is also assessing the impact of impurities in recycled aluminium and seeking technical solutions through new aluminium alloy development to ensure these do not become a barrier to achieving our 75% goal.



The highest grade and most accessible source of scrap is our own production waste. Jaguar Land Rover is continuing to develop the closed loop recycling processes on its sites with improved material segregation. These optimised processes are also being incorporated at strategic companies in our supply chain to provide high grade aluminium captured from manufacturing processes that will be collected and re-melted into automotive sheet. Finally, we will need to source additional material from the consumer waste stream – this includes non-automotive sources such as recycled aluminium cans – with the aim to increase flexibility of recycled material supply and promote recycling beyond automotive sources to reduce the amount of aluminium sent to landfill.

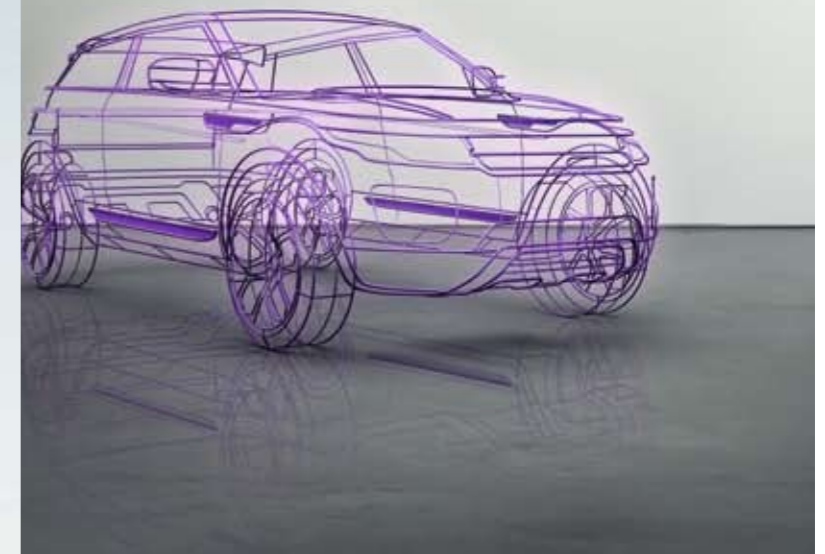
REALCAR's success will be a key contributor to the production of low CO<sub>2</sub> performance and luxury cars in the UK, and in particular to Jaguar whose future is already committed to all aluminium bodies.



# Renewable and recycled materials

By 2012 we will have increased by 25% the quantity of renewable and recycled materials used in our vehicles, for example in bodywork, interior and exterior mouldings, engine covers, and fabrics made from recycled bottles.

As we launch new models we are progressively increasing the range of components made from these materials and the overall percentage of the vehicle they represent. We have prioritised incorporating up to 60kg of these components in new models.

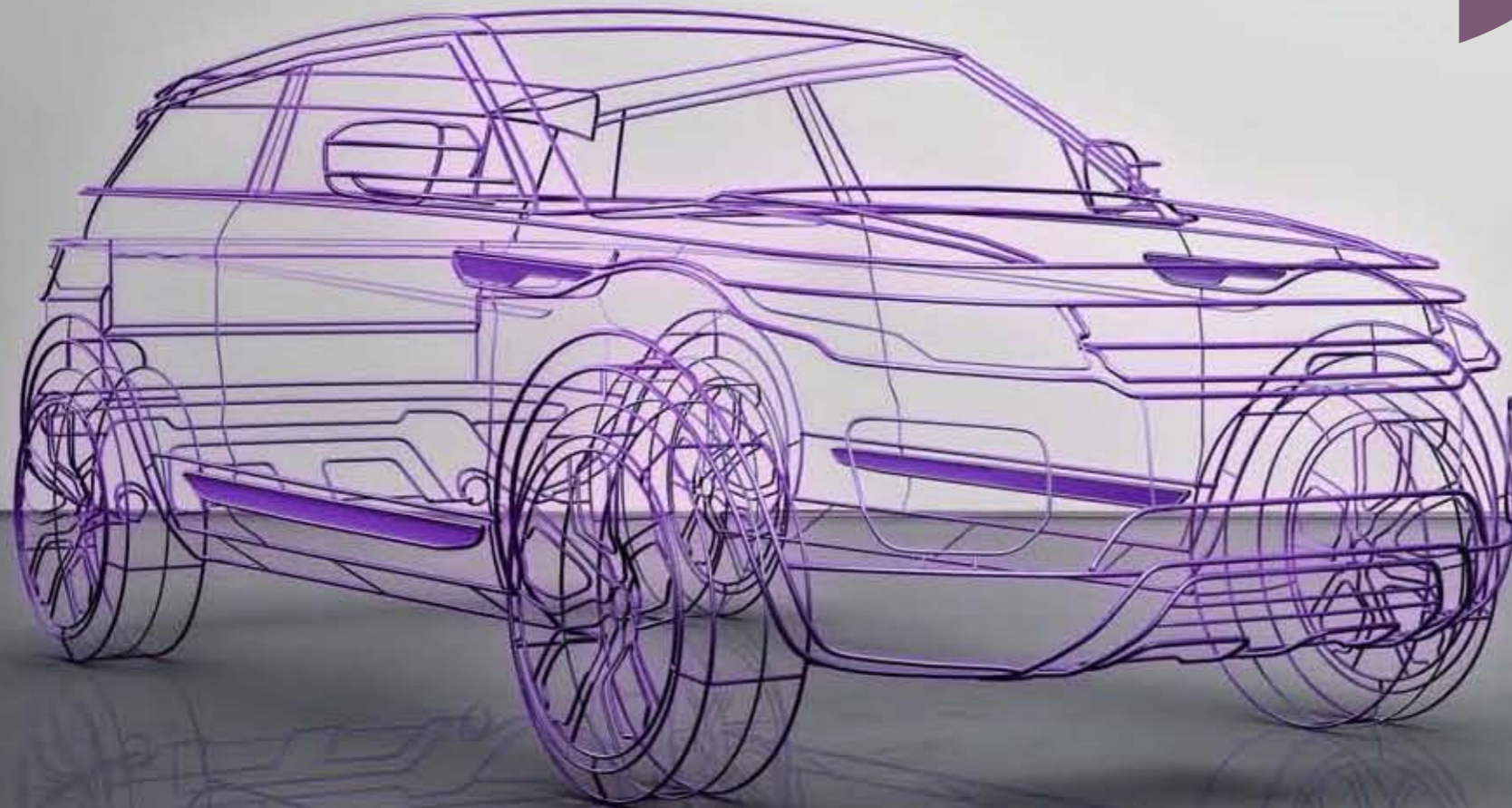




The Range Rover Evoque and the Jaguar XJ represent the current state of the art.

## Use of renewable and recycled materials

### Range Rover Evoque



# 16kg

of recycled plastic in headliner, seat covers, centre console, wheel arch liners, air cleaner, cooling fan and shroud, air ducting, side under trays, parcel shelf, engine cover and subwoofer box.

# 21kg

of natural materials

21kg of natural materials including the leather used in the seat covers, instrument panel and door casings, and natural materials used in the carpets and body insulation.

High quality Morzine trim fabric used on the headlining and pillars is entirely produced from recycled polyester sourced from recycled bottles and fibres. Using recycled material results in a 66% lower energy demand and 54% lower carbon footprint during production.

Dinamica<sup>®</sup> trim material made with 100% recycled polyester. The recycled material is primarily sourced from post-consumer waste, so that each car uses the equivalent of 40 full-size plastic bottles achieving a 77% lower carbon footprint in these components.



# Jaguar XJ

Bootlid trim, rear seat trim board are made from recycled polypropylene

Sustainably sourced wood veneers

**30kg** of recycled materials

Body approximately

**40%** recycled aluminium

Boot floor made from cardboard honeycomb





## Product end-of-life

Our cars are designed to be 85% recyclable and 95% recoverable and all our current models meet the EU End of Life Vehicles (ELV) Directive requirements for recovery and reuse or recycling.

We use an experimental facility where vehicles are disassembled and examined to find easier ways of dismantling at the end of their life. The information from these disassembly studies of current and older Jaguar and Land Rover models is used directly in the model development process.

We produce manuals on how to dismantle our vehicles in accordance with International Dismantling Information System (IDIS) requirements. We mark vehicle parts according to their content (plastics, elastomers, metals, etc.) to make it easy for different materials to be identified

and separated. The manuals also contain information about how hazardous materials and fluids should be handled safely and disposed of responsibly.

To optimise recycling and treatment at the end of vehicle life, we provide information to dismantlers through IDIS. This information is available to all approved end of life vehicle treatment centres in all EU member states and other countries that have adopted the EU model of vehicle treatment at end-of- life. More information on IDIS is available at [www.idis2.com](http://www.idis2.com).

## Takeback

Jaguar Land Rover was among the first manufacturers to announce a comprehensive plan to meet ELV legislation. We were also the first company in the automotive sector to establish takeback points in all four countries of the United Kingdom. Working in partnership with Cartakeback.com, Jaguar Land Rover provides customers with a free takeback service. All the contracted sites are licensed by the Environment Agency as authorised treatment facilities. They also meet additional Jaguar Land Rover quality standards. The full list of appointed takeback facilities for the UK is available at [www.cartakeback.com](http://www.cartakeback.com).

At the treatment centres, vehicles are first treated to reduce impact. This involves:

- **Draining of all fluids and refrigerant gases**
- **Removal of the batteries and tyres**
- **Removal of parts containing heavy metals**
- **Neutralisation of airbag systems.**

Any saleable parts will be removed and sold. Vehicles are then shredded and separation techniques used to recover metals for recycling into new ferrous and non-ferrous metals. Some non-metal components are also recycled, such as glass (may be used as an aggregate for road building). The remaining residue is sent to landfill. Enhanced treatment of shredder residue in post shredder technology plants will in future reduce the amount sent to landfill.

We have reduced the use of heavy metals in our vehicles to the minimum amount achievable with current technology. They are used in small quantities in essential safety and emissions systems. Our treatment facilities ensure that heavy metals enter a closed loop recycling system and are not released to the environment.

In 2009, within our Aftersales and Service business function, Jaguar Land Rover remanufactured over 69,000 old and used vehicle parts – a 15% increase on 2008.

# Safety

Design for safety – the safety of everyone who drives and travels in our vehicles is an essential part of the specification, design, development and construction of all Jaguar and Land Rover vehicles.

We use computer models of our new vehicles to conduct a series of simulated crash tests. Virtual tests enable us to identify and mitigate potential risks before building prototype vehicles. When a prototype vehicle has been produced, we conduct rigorous crash tests to ensure all components meet our strict safety requirements.

Passenger safety features built into our vehicles include enhanced front and side airbags, and headrests designed to minimise whiplash.

We help drivers to avoid accidents by designing our vehicles to be capable of responding rapidly to emergencies in different weather and terrain. Technology such as braking aids, Dynamic Stability Control and Active Roll Mitigation make our vehicles safer to drive. The elevated driving position in

Land Rovers also provides a better view of the road ahead improving the driver's ability to spot hazards.

We are progressively introducing 'active safety technologies' that help eliminate common causes of accidents including reversing cameras, automatic cruise control and blind spot monitoring.

All Jaguar vehicles are now fitted with a 'deploying bonnet' system to protect pedestrians. In the event of a pedestrian being struck, sensors within the bumper trigger actuators which lift the bonnet before the pedestrian makes contact with it. The bonnet design is optimised to absorb energy gradually and minimise injury.





## Independent safety testing

In addition to our own extensive safety tests, Jaguar and Land Rover vehicles are also assessed by independent third party safety organisations to ensure they meet international safety standards. The European New Car Assessment Programme (Euro NCAP), provides third party assessments of vehicle safety performance for consumers and the automotive industry, ranking vehicle safety from zero stars to five stars.

Euro NCAP awarded a maximum five-star rating to Freelander 2 in 2007 for its score against the adult occupant protection. The Freelander 2 also obtained four stars for the child occupant protection (at the time of testing four stars was the highest attainable score in this category). Discovery 3 achieved four stars for adult and child occupant protection with The Range Rover being rated as four stars in the adult occupant protection. (At the time of The Range Rover test the child occupant star rating did not exist.)

In future, Euro NCAP assessments will introduce a combined rating that includes crash performance, pedestrian performance, child protection and active safety. NCAP has not selected any current Jaguar models for testing, and we expect the Jaguar XF to be the first Jaguar to be assessed against this protocol.

Jaguar and Land Rover vehicles are also sold in the United States where they meet the stringent safety criteria of the US Federal Motor Vehicles Safety Standards (FMVSS). These standards are designed to reduce traffic accidents and injuries resulting from traffic accidents.



Vehicle Model	Adult	Child	Pedestrian
The Range Rover	★★★★★	Not assessed	★
Discovery 3	★★★★★	★★★★★	★
Freelander 2	★★★★★	★★★★★	★

**NCAP has not selected any current Jaguar models for testing, and we expect the Jaguar XF to be the first Jaguar to be assessed against this protocol.**



# Engaging customers on sustainability

Much of our direct contact with customers takes place through hundreds of franchised Jaguar and Land Rover dealerships around the world.

This includes engagement on sustainability – explaining what we are doing to help reduce vehicle emissions and improve our environmental performance.

Dealerships must display the Jaguar Land Rover sustainable development policy and information on sustainability relating to our vehicles. Sustainability information is also included in welcome packs for customers and other communications throughout their relationship with us whilst they own their Jaguar or Land Rover.

We train dealership staff on our sustainability activities so they are fully briefed to respond to relevant questions from customers. They must complete online training courses – including modules on environmental topics such as reducing tailpipe CO<sub>2</sub> emissions – before they qualify to sell our vehicles. Sustainability is also covered in information packs and training materials for dealers at each new model year launch.

Priorities include promoting safe driving and minimising environmental impacts of vehicles during use and at end-of-life.

## Promoting responsible and safe driving

We encourage all our customers to drive in a safe, careful and responsible manner. For Land Rover customers, we provide additional advice on driving off-road. As part of the 'Land Rover Experience' at our global network of purpose-built, off-road courses, we offer Land Rover owners courses on safe off-road driving. Our instructors are fully trained on how to drive with minimal impact on the environment.

Read about design features that help to improve safety (see pages 31 and 32).

## Customer CO<sub>2</sub> offsetting

Our CO<sub>2</sub> offset programme (see page 34) enables customers to compensate for the emissions that their vehicles produce. Both Jaguar and Land Rover customers can offset emissions from their vehicle, through bespoke schemes run by our partner ClimateCare.

We direct Jaguar customers to ClimateCare's website where they can choose to offset emissions. Land Rover customers in 10 markets participate in the programme to offset emissions from the first 45,000 miles they drive as standard when they purchase a vehicle, and we provide them with updates on offset projects through regular e-newsletters. When we introduce the offset programme to a new market, we provide Land Rover dealers with training so they can explain the programme and the value of CO<sub>2</sub> offsetting to customers.

## Product take-back

Dealerships advise customers on what to do when their vehicle reaches the end of its useable life. We provide a free take-back service in the European Union to help customers dispose of vehicles responsibly at end-of-life, in compliance with End-of-Life Vehicle (ELV) legislation.

In partnership with cartakeback.com, we have established a total of 250 take-back points in the UK. All sites are licensed by the Environment Agency as authorised treatment facilities and meet our own additional quality standards.

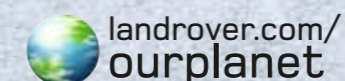
Read more about end-of-life vehicle management (see page 30).

## The Land Rover Driving Code

Driving a Range Rover or Land Rover should be an exhilarating experience – and one that can be enjoyed responsibly.

The following simple guidelines can help our customers do so:

- Rights of access vary from country to country, so don't assume they will be the same as back home, always check. If necessary, seek permission to cross private land.
- Follow existing routes where possible.
- Respect the peace and tranquillity of others.
- Avoid imposing your presence on other road or track users. Remember to give them sufficient space in which to operate without feeling intimidated or annoyed.
- Drive carefully to minimise erosion and damage to the land. Avoid causing ruts as they form channels that lead to erosion.
- 'As slow as possible, as fast as necessary' will get you through most obstacles and reduce environmental impact.
- If your vehicle is equipped with a 'differential lock', engage it before venturing onto low traction surfaces (mud, sand etc) to minimise the likelihood of wheel spin and damage to the ground. If your vehicle is equipped with Terrain Response™, simply turn the dial to the appropriate setting.
- Animals come first! All animals can be startled by vehicles, whether on or off road, so be prepared to proceed very slowly or switch your engine off and wait. Let them move off at their own pace.
- Make sure your vehicle is fully prepared for your journey. Take the right tools and supplies, check regularly for any leaks and avoid spilling oil, fuel and hydraulic fluids.
- Be mindful of your actions, even when you're not driving. Use eco-friendly cleaning material, wash vehicles away from water courses and take your litter home with you.
- When preparing to go back on the road, check lights, tyres and bodywork, and clean number plates. Once on-road, drive slowly to prevent damage to other road users from mud and stones flying off the tyres.





# CO<sub>2</sub> OFFSET PROGRAMME

**We have set targets to reduce the climate change impact of our vehicles and manufacturing processes. CO<sub>2</sub> offsetting forms a central part of our carbon management plan while we develop lower emission vehicles and more efficient manufacturing. It also enables customers to compensate for emissions from using Jaguar and Land Rover vehicles.**

Offsetting balances manufacturing and vehicle emissions by investing in projects that help reduce emissions in other parts of the world. We run our CO<sub>2</sub> offset programme in partnership with ClimateCare. Initially launched in September 2006 in the UK, we have now extended the programme to December 2011. Through ClimateCare, we prioritise investment into renewable energy, energy efficiency, and clean technology projects. We estimate that our programme will offset 3 million tonnes of CO<sub>2</sub> by 2012.

We offset all manufacturing assembly emissions from our three UK factories: Castle Bromwich, Halewood and Solihull. In 2009, this totalled 215,000 tonnes of CO<sub>2</sub>.

Land Rover enables customers in ten countries spanning the UK, Europe, Middle East and Asia (representing around 40% of our 2009 global sales) to offset emissions from the first 45,000 miles (72,000 km) of vehicle use as part of their purchase. Jaguar customers can also choose to offset vehicle emissions by investing in selected projects through ClimateCare, and similarly, Land Rover customers can choose to offset emissions beyond the standard 45,000 miles.

Our offset programme is overseen by an operating committee that meets quarterly to review progress. The committee is currently chaired by Iain Watt from Forum for the Future, and its members include representatives of ClimateCare and Jaguar Land Rover.



climatecare



## Offset projects

Jaguar Land Rover currently invests in 34 diverse offset projects in 13 countries (see charts). All emission reduction projects funded by our CO<sub>2</sub> offset programme go through a rigorous validation and verification process to ensure the emissions reductions are made. Projects follow United Nations protocols for carbon offsetting and, where applicable, comply with The Gold Standard, Voluntary Carbon Standard and the Social Carbon Standard.



**Biomass in Brazil:** (Social Carbon standard): a group of 15 initiatives to encourage small ceramics manufacturers to switch their power source from oil and wood to waste renewable biomass such as rice and coconut husks, sawdust, and nut residues. This project aims to deliver over 300,000 tonnes of emissions reductions and helps prevent illegal deforestation.



**Rift Valley Hot Springs in Kenya:** a geothermal energy project that harnesses power from volcanic activity in the Rift Valley to drive turbines that provide electricity to local industry. This project aims to offset 100,000 tonnes of CO<sub>2</sub>.

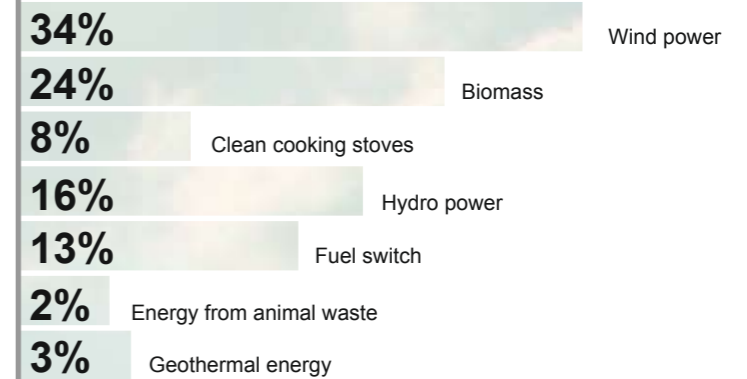


**Wind turbines in Aliaga, Turkey (Voluntary Gold Standard):** investment to develop a wind farm near an industrial region to feed renewable energy into the grid, offsetting around 35,000 tonnes of CO<sub>2</sub>.

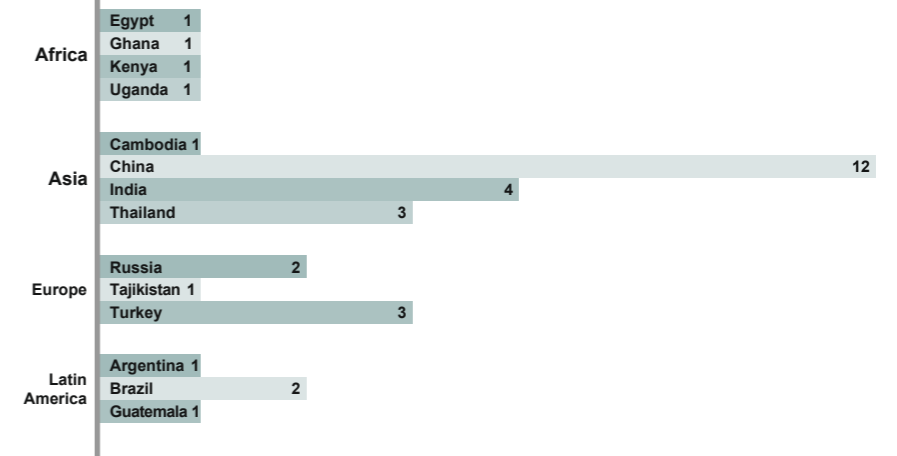


**Efficient cooking stoves, Uganda (Voluntary Gold Standard):** an initiative to supply efficient wood burning stoves to schools and other institutions. This offsets around 220,000 tonnes of CO<sub>2</sub> by reducing emissions from cooking. It also helps to prevent deforestation by decreasing the amount of wood needed, and reduces indoor air pollution because the stoves create less smoke.

### Diversity of CO<sub>2</sub> offset projects supported by Jaguar Land Rover



### Geographic spread of Jaguar Land Rover offset projects





# Responsible operations

Minimising environmental impacts from our operations is a core part of our Environmental Innovation strategy (see page 11). We are investing £9 million in efficiency measures across the business, targeting the areas where we can achieve the most significant reductions.

The main impacts from our operations are from manufacturing vehicles at our sites in Castle Bromwich, Halewood and Solihull. Our commitment to lean manufacturing means we aim to maximise efficiency by using fewer resources and creating less waste, which helps to cut costs too. We are also working to reduce impacts from our product development centres in Gaydon and Whitley.





# Environmental management

Our business-wide Environmental Management System (EMS) helps us to identify, measure and reduce environmental impacts from our operations. Since 1998, each of our sites has been certified to the internationally recognised environmental management standard ISO 14001, with annual third-party audits to confirm compliance.

We set targets for each site and each function in key areas such as energy use, water use and waste to drive continual improvement and help us meet our overall target to reduce the environmental footprint of our business by 25% by 2012 (see Environmental Innovation targets, page 12). Data on environmental impacts from each site is reviewed by senior management to assess progress.

Environment teams at each site are responsible for implementing the EMS and meet regularly to review progress against targets, discuss relevant new regulations and share best practice. The Six Sigma practices we use to help improve quality and efficiency throughout the business also cover environmental impacts.

## Compliance

Our EMS is designed to ensure that we fully comply with all relevant legislation and regulations. We monitor changes to regulations and regularly update the register of environmental legislation applicable to our operations which is posted on our intranet. We also maintain a good working relationship with regulatory bodies and engage with them to advocate the development of appropriate regulations.

Compliance is managed by representatives at each site and assessed through an annual assurance process, supported by internal compliance audits.

Our Corporate Environmental Compliance team is responsible for ensuring we fulfil the requirements of regulations such as the Carbon Reduction Commitment scheme and managing carbon allowances associated with our EU Emissions Trading Scheme permits and our UK Climate Change Agreements.

Jaguar Land Rover did not receive any fines or prosecutions in 2009.

## Raising awareness

Getting employees from across the business involved in our efforts to reduce impacts is an important element of our Environmental Innovation strategy. The strategy itself was launched with an extensive campaign of eye-catching materials and memorable catchphrases to raise awareness of our sustainability programmes. The campaign received a commendation from Design Week's 2009 Benchmarks Best in Brand Communication Awards.

Training on Environmental Innovation was led by senior leaders and has been cascaded throughout the business (see page 11). This builds on existing environmental training for all employees as appropriate to their role. Individuals and teams are encouraged to share best practices by entering our internal Environmental Innovation awards (see page 38).





## Environmental Innovation award winners

In October 2010, we announced the winners of our new internal awards to recognise actions and projects that have made a real difference to Environmental Innovation. The 34 projects short listed for an award ranged from improved efficiency in manufacturing processes to projects that drive significant improvements in vehicle emissions reductions.

The award for outstanding individual effort went to a member of our logistics team who has led efforts to reduce emissions from transport of parts and finished products, saving over 8,000 tonnes of CO<sub>2</sub> by improving the efficiency of parts collection alone.

The award for the best overall project went to the team behind the development of a new demonstrator vehicle – a Range Extended Hybrid Electric Vehicle (see page 21). The team exceeded the original specification for the vehicle, achieving tailpipe emissions of just 94.8 grams of CO<sub>2</sub> per kilometre. The project will feed into the development of further hybrid vehicles.



# Performance

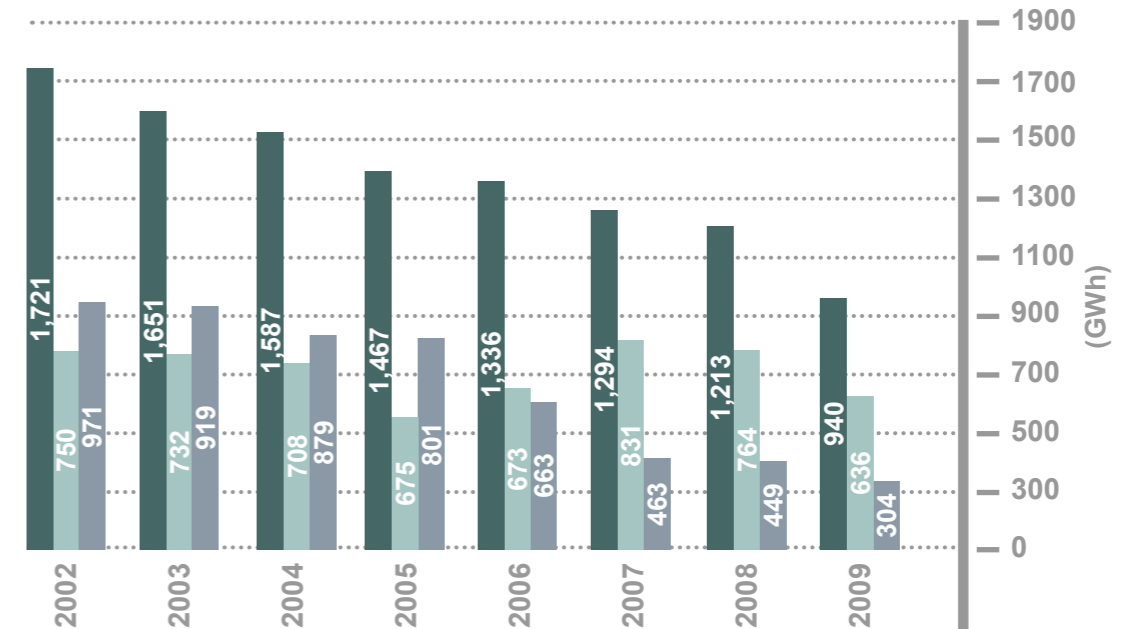
As a result of the economic downturn, our production volumes fell significantly in 2009 – by nearly 40% in total.

The corresponding sharp drop in the total environmental impacts from our operations is therefore not representative of the overall trend, which has shown a more gradual reduction over time.

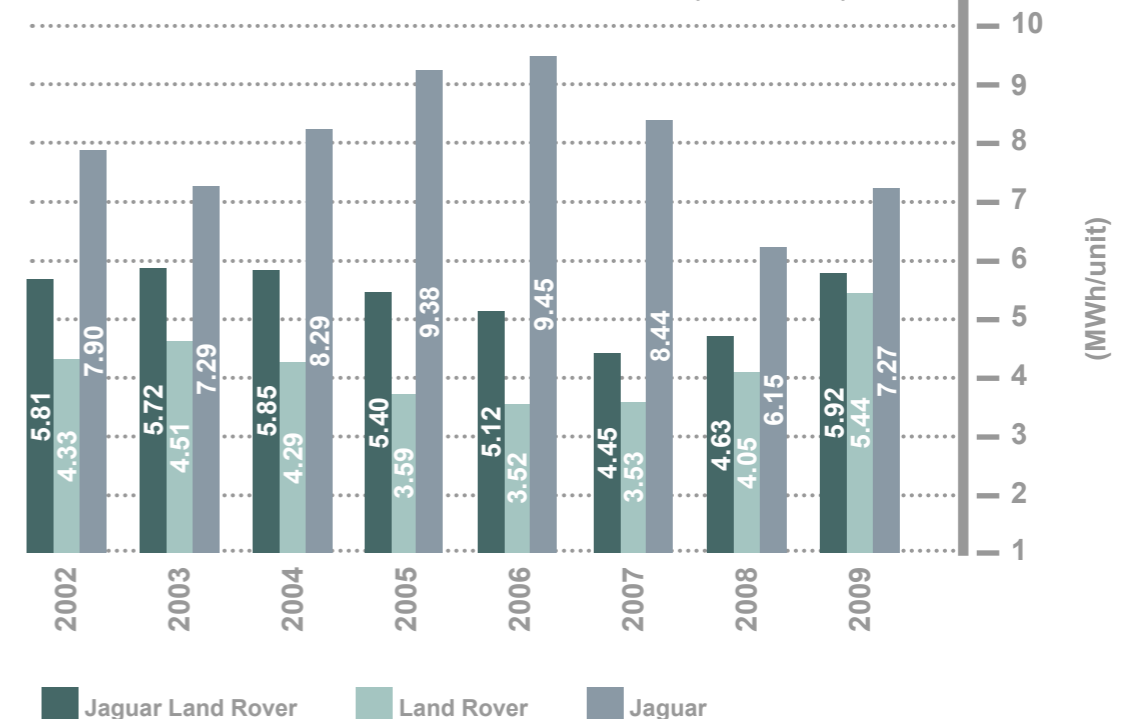
We are confident that our ongoing efforts to improve efficiency will be evident in continued reductions even as production volumes increase in 2010 and beyond.

## ENERGY USE AND CLIMATE CHANGE

### TOTAL ENERGY USE (GWh)



### ENERGY USED PER VEHICLE PRODUCED (MWh/unit)



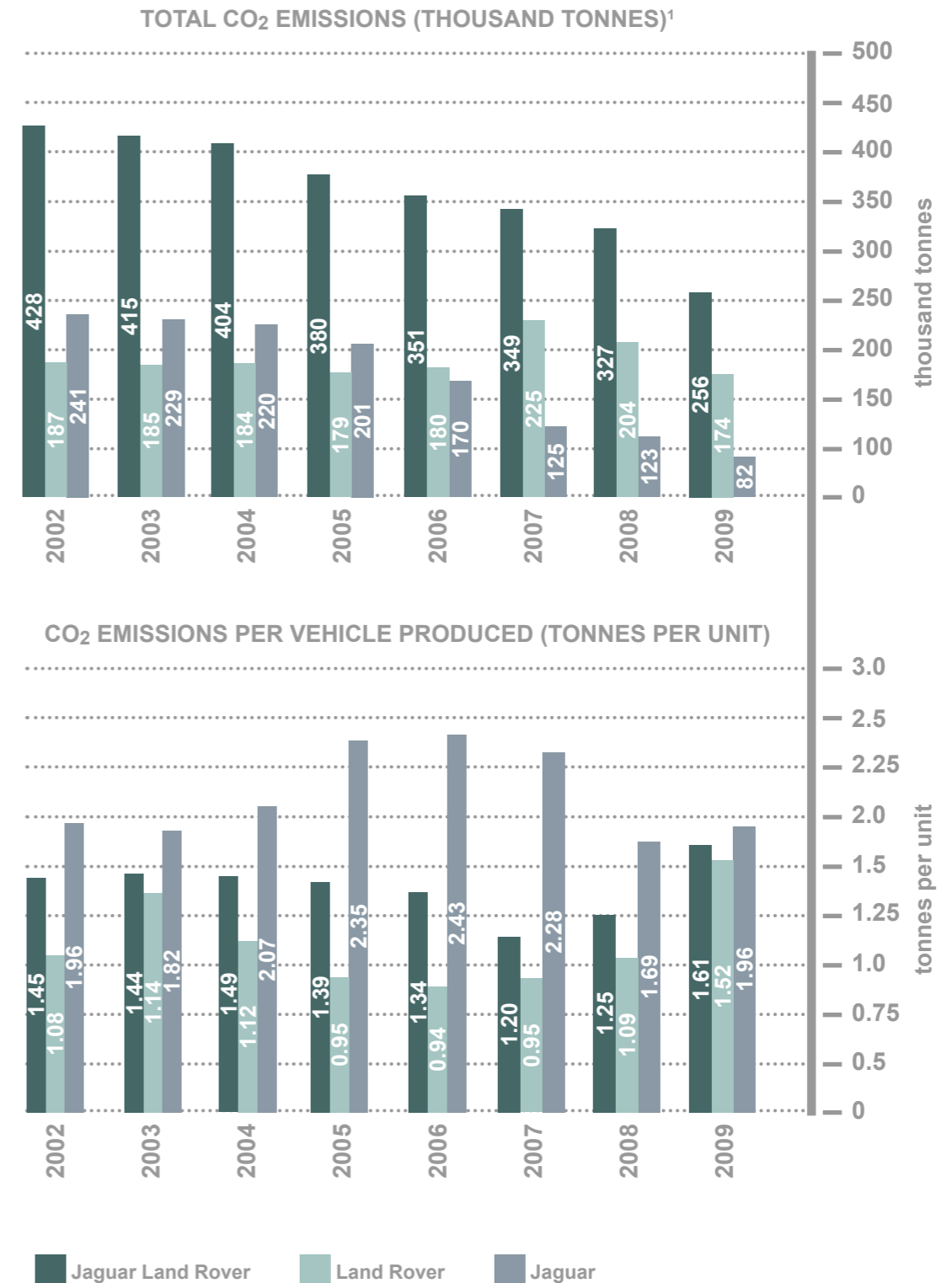


Our goal is to cut emissions by 25% by 2012 (from the 2007 baseline). We used a total of 940,000 MWh of energy across our sites in 2009, resulting in a total of 256,000 tonnes of CO<sub>2</sub> emissions. This is equivalent to 5.92MWh and 1.61 tonnes of CO<sub>2</sub> per vehicle produced.

Although our total energy use and emissions have decreased due to reduced production volumes in 2009, the energy use and emissions per vehicle we produced have increased despite a wide range of initiatives to improve energy efficiency across the business. This is because the baseload – the minimum energy use needed to operate the factory, whether one car is produced or 100 – is unaffected by production volumes. This static amount therefore makes up a bigger proportion of the energy use per vehicle if fewer are produced. A key focus for our energy efficiency programmes is to find ways to minimise this baseload.

Energy use is closely monitored at all our sites through our building management system, which records how much energy is being used in each work area for lighting, heating and air conditioning at half-hourly intervals. This enables us to pinpoint unusually high energy use, in some cases to a specific lighting block. Site energy teams meet weekly to identify and investigate anomalies, and take appropriate action.

Our cross-functional Carbon Working Group, established in 2009, meets monthly to share best practice across all sites, set targets, discuss progress, and review and recommend projects for investment.



<sup>1</sup>Includes emissions from use of electricity, gas and gas oil at manufacturing and product development sites



## Improving energy efficiency

In 2009 and 2010, we have continued to invest in a wide range of measures to help optimise processes, improve efficiency, and cut energy use and emissions. Large and small, and implemented across all sites unless otherwise stated, these include:

- **Installing variable speed drives on air compressors to match load with demand at paint and body shops, saving 310 tonnes of CO<sub>2</sub> in 2009**
- **Investing in more efficient equipment such as pumps, motors and compressors which will save around 6,000 tonnes of CO<sub>2</sub> a year**
- **Replacing key components and reprogramming robot arms used in the production line at Solihull to save £34,000 and 200 tonnes of CO<sub>2</sub> a year**
- **Reducing the temperature of hot water produced by boilers at Castle Bromwich from 160°C to the 145°C needed, saving 9,200 tonnes of CO<sub>2</sub>**
- **Improving the efficiency of boilers, cutting nitrogen oxide emissions at Halewood by 21% in 2009**
- **Implementing a range of initiatives to cut energy use in our paint shops (see case study), including powering down part of the spray booth at Halewood, cutting CO<sub>2</sub> emissions by 1,000 tonnes per year**
- **Introducing ambient light detectors, motion detectors and zoned lighting so lights only come on when needed**
- **Responding to weather changes so heating and air conditioning is only used as necessary**
- **Minimising production run periods and targeting out of hours energy consumption when the site is idle**
- **Incorporating energy efficient measures at our new training academy for dealership staff in Warwick, such as 'phase change' plasterboards which regulate room temperature.**

## Alternative energy sources

A new modulation unit installed in 2009 is helping us make better use of our on-site combined heat and power (CHP) plant Castle Bromwich, saving 2,000 tonnes of CO<sub>2</sub> in 2009 and 2010. A similar CHP plant at Solihull has been reducing emissions since 1994.

We are also exploring the viability of on-site renewable power sources including ground source heat pumps, photovoltaic panels and energy from waste.

## Offsetting CO<sub>2</sub> emissions from manufacturing

As part of our integrated approach to reducing emissions, we offset all CO<sub>2</sub> emissions from manufacturing assembly through our offset programme in partnership with ClimateCare (see page 34).

## Cutting energy use in our paint shops

Paint shops are the single largest consumer of energy in our manufacturing process. Our Advanced Manufacturing Engineering team recognised that the paint shops at all three of our manufacturing sites face many of the same challenges and saw an opportunity to coordinate our efforts to cut energy use by sharing best practice between sites.

The Jaguar Land Rover 'Paint Tri-plant Energy Reduction Team' was created in early 2009 to identify and implement ways to reduce energy use in paint shops at our Halewood, Castle Bromwich and Solihull sites. The team has implemented more than 50 individual initiatives – from optimising use of air compressors to hibernating parts of the paint shops when not in use and insulating pipework.

So far, these have achieved a total reduction of 49GWh of energy, saving 13,200 tonnes of CO<sub>2</sub> emissions and over £1.5 million in energy costs since mid-2009.



## Transport

CO<sub>2</sub> emissions from transporting parts and finished products totalled 72,639 tonnes in 2009, making up a significant part of our operational carbon footprint. Components from our suppliers travel a total of 25 million miles to our factories, and finished Jaguar and Land Rover vehicles are transported around 50 million miles to customers in over 90 markets around the world.

The challenge of cutting transport impacts is growing. Outbound, our customer base grows in long-distance markets such as China and Russia; inbound, we are sourcing more components from suppliers in emerging markets.

Our aim is to cut emissions from transport by 15% by 2012 (from the 2007 baseline).

To achieve this goal, we are focusing on:

- **Reducing the total mileage travelled by making our logistics operations more efficient optimising routes and ensuring trucks travel with full loads**
- **Cutting emissions per mile by improving fuel efficiency of trucks and using lower-carbon modes of transport such as trains where possible.**

Working closely with suppliers is essential because much of our transportation is out sourced. We require suppliers to meet strict standards on environmental performance (see page 48). When we changed our main supplier for UK inbound transport in 2008, the contract included a commitment to provide a dedicated fleet of new, more efficient trucks for Jaguar Land Rover collections. With 3% lower tailpipe emissions, using these trucks is helping to cut our transport footprint. Training was also introduced in 2009 for truck drivers to promote more fuel efficient driving.

In 2009, initiatives to make our inbound logistics operations more efficient increased the average load carried by trucks to 85% full in the UK and 86% full in Europe. For example, we began sharing deliveries with BMW and Ford, where we have common suppliers, to help ensure more trucks travel with full loads. We have also reviewed and improved our packaging specifications to fit more parts in each load, and make use of shared network return trips to send packaging back to suppliers for reuse.

Products sold in the UK are transported to dealers by truck. However, we have switched transport from road to rail wherever possible for products travelling to ports for export. In 2009, we saved almost 1,000 tonnes of CO<sub>2</sub> by sending over 39,000 finished vehicles to ports by rail from Halewood and Castle Bromwich. The main shipping company we use has its own target to cut emissions by 5% in 2010. This will have a significant impact on our emissions because, although sea transport is more efficient than road transport, it makes up a much larger proportion of outbound miles travelled because the distances involved are much greater.



## Waste

Minimising waste and recycling as much as possible is a key aspect of our commitment to lean manufacturing. Most scrap metal, wooden packaging, cardboard and plastics are recycled, and we require suppliers to use reusable packaging wherever possible which we return for reuse (see page 48).

The total waste we produced almost halved in 2009 to 14,133 tonnes, equivalent to 89kg of waste per vehicle produced. We recycled more than half (51%) of the non-hazardous waste we produced in 2009 – a significant increase from 32% recycled the previous year. Our target is to cut waste sent to landfill by 25% by 2012, from the 2007 baseline.

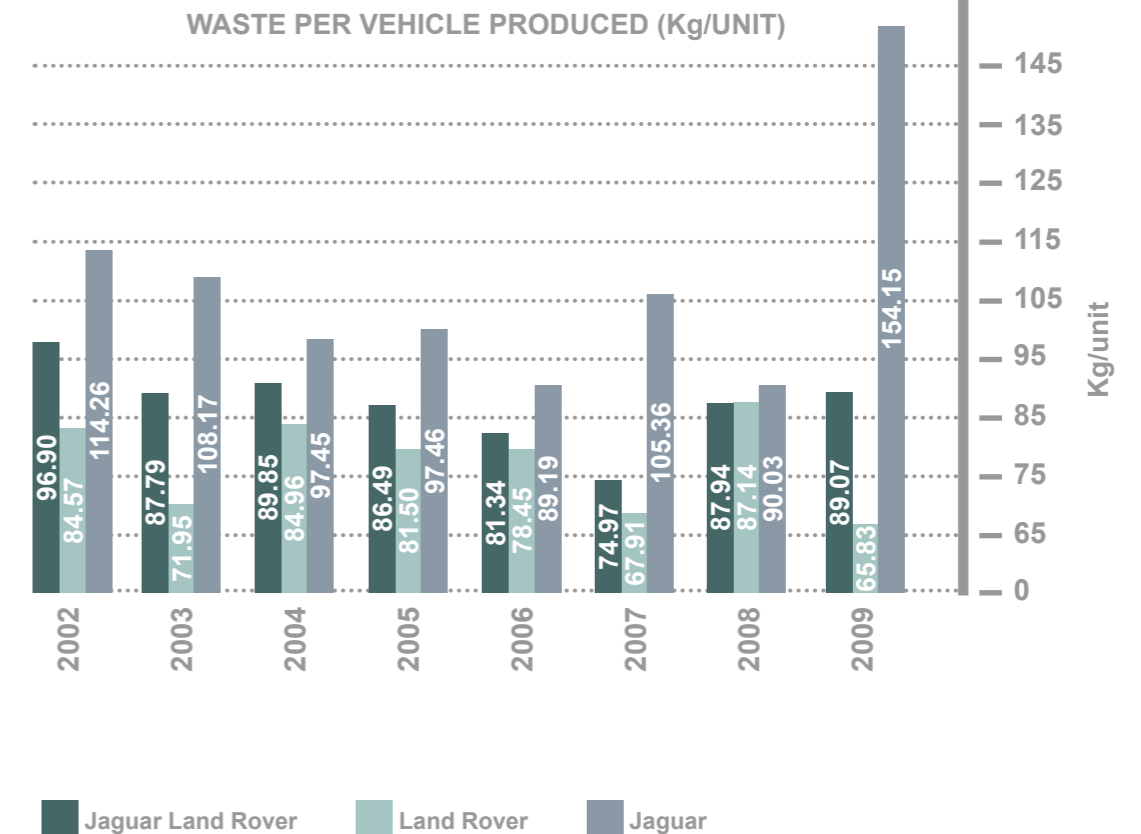
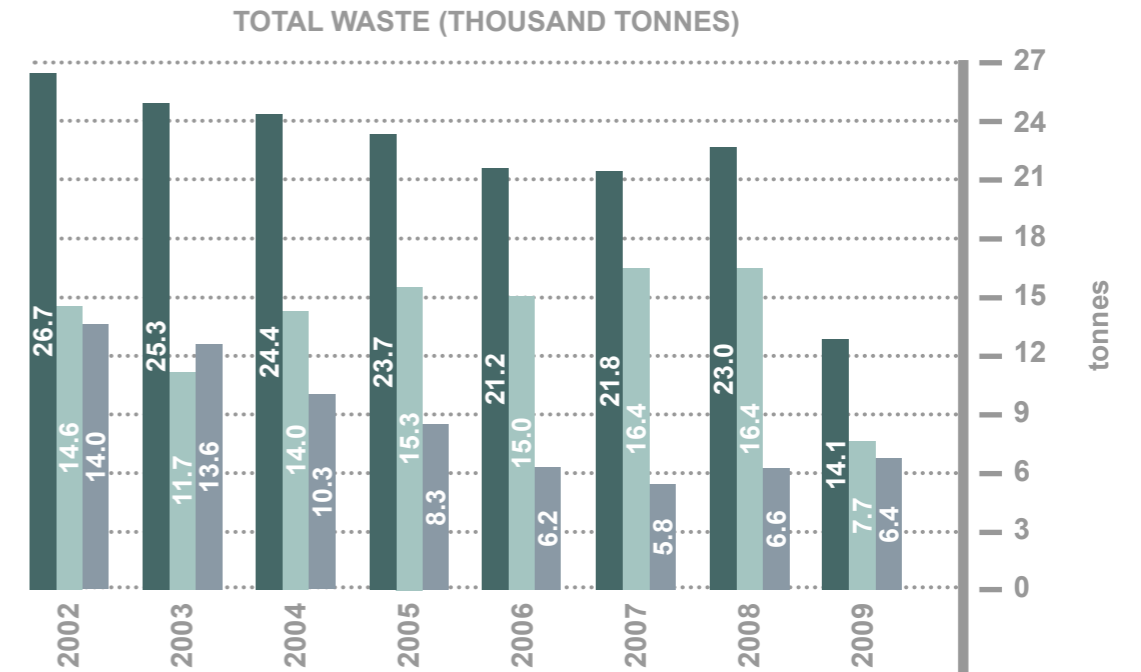
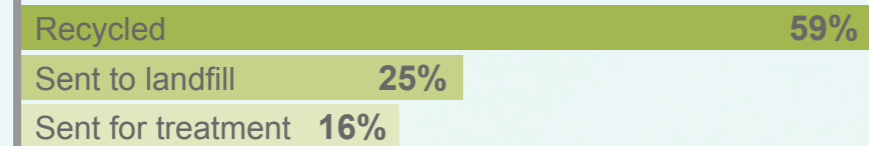
These improvements were achieved as a result of our sites' strong focus on recycling and waste reduction throughout the year. For example, Halewood has reduced the amount of general waste sent to landfill by 85% by sending waste to mixed recycling facilities. Since April 2009, the site has also sent nearly 300 tonnes of waste from its paint shop to an external facility to produce compost with a high nutrient content for agricultural and landscaping purposes.

Following a successful pilot at Halewood, all three of our manufacturing sites now use sealant containers with removable plastic liners so the large metal containers themselves can be recycled rather than treated as hazardous waste. Gaydon's innovative initiatives to cut waste sent to landfill include converting waste food into energy (see case study).

When the X-Type Jaguar was discontinued at the end of 2009, we made sure none of the equipment that had been used to produce it at Halewood went to waste. Much of it was reused on the site to manufacture the new Range Rover Evoque, some went to Castle Bromwich for use on a future model and the remaining robots were sold to a third party for reuse. X-Type specific fixtures that could not be reused were sent for recycling.

Using state-of-the-art technology to test vehicles 'virtually' at Whitley and Gaydon has cut the amount of waste and fuel use during product development by reducing the need for pre-production prototype vehicles. The design of our vehicles also plays an important part in waste reduction, by using more recycled and reusable materials (see more about our products on page 27).

### RECYCLING AND DISPOSAL OF NON-HAZARDOUS WASTE IN 2009





## Gaydon turns waste food into energy

A trial programme at our headquarters and The Heritage Motor Centre in Gaydon is transforming waste food from our catering facilities into a renewable source of energy.

Instead of being sent to landfill, waste food is used as biomass fuel to generate electricity. Over 43 tonnes have been diverted from landfill in the first seven months, generating 4,200kWh of electricity and saving an estimated 3.7 tonnes of CO<sub>2</sub> emissions.

This is just one of a wide range of initiatives we have introduced at Gaydon and Whitley product development sites, working closely with our facilities and waste management supplier. For example, cleaning wastewater interceptors on-site rather than taking the entire contents to an external treatment facility has cut waste from interceptors by 97% from 180 tonnes to only 4.5 tonnes a year. Office recycling stations also divert around 500 tonnes of waste from landfill each year.

We are also exploring the possibility of sending dust and other waste from our product development processes to another company that will use it to produce board materials.



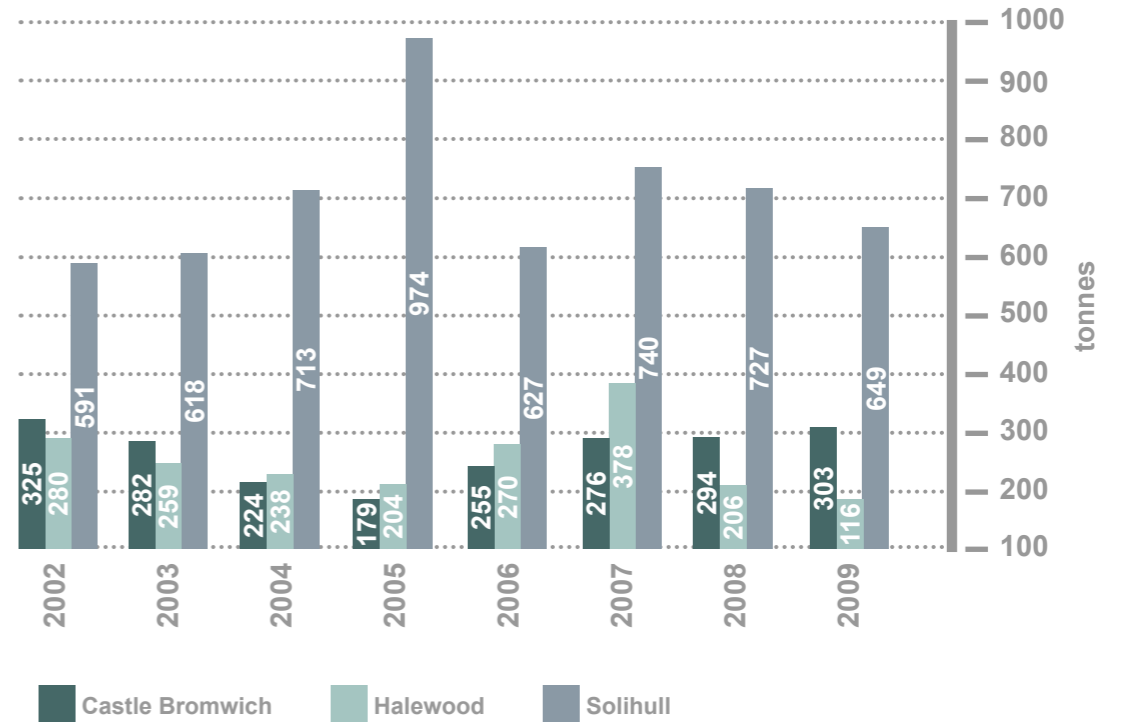
## Solvents

Emissions of volatile organic compounds (VOCs) from solvents used in our paint shops can contribute to local air pollution. We are committed to minimising our use of solvents and related VOC emissions.

Our paint shops use water-based, low-solvent coatings to reduce VOC emissions without compromising paint quality. In 2009, reducing the number of primer colours used in the painting process from twelve to four at Halewood led to fewer solvent washes between colours, cutting the site's VOC emissions by 17%.

We used a total of 1,189 tonnes of solvent in 2009, primarily at our three manufacturing sites. Around 413 tonnes of solvent was reclaimed for reuse. Each of our paint shops holds an Integrated Pollution Prevention and Control permit and we report the amount of solvent we use each year according to the UK Solvent Emissions Directive.

TOTAL SOLVENTS USED AT MANUFACTURING PLANTS (TONNES)



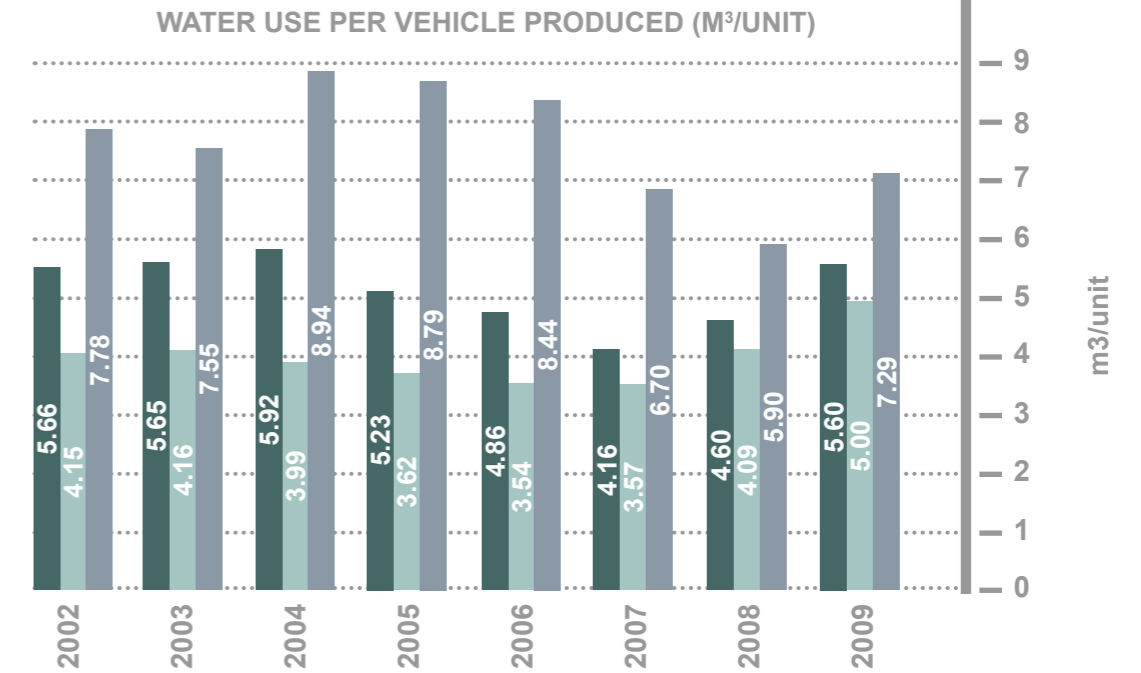
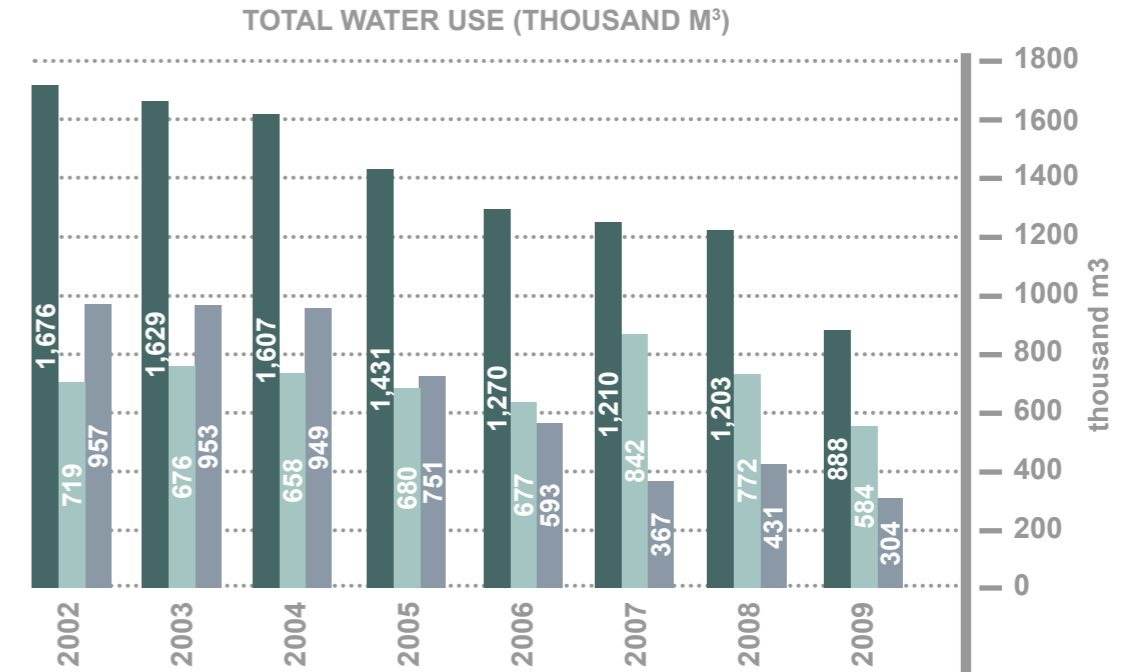


# Water

Our total water use in 2009 was 888,000m<sup>3</sup>, equivalent to 5.6m<sup>3</sup> per vehicle produced. We aim to reduce total water use by 10% by 2012 from the 2007 baseline.

Identifying and sealing water leaks at Solihull has cut water use by 50,000m<sup>3</sup> a year. At Halewood, we have saved over 5,000m<sup>3</sup> of water a year by eliminating part of the manufacturing process where the body of a vehicle is washed before painting, without any negative impacts on the quality of the painted finish. An enzyme-based treatment being introduced at Whitley to reduce the amount of water used in urinals will save an estimated 3,000m<sup>3</sup> of water per year, and we are also trialing this treatment at Halewood.

As well as looking for ways to reduce water use, we also conduct regular checks to help ensure waste water from our sites does not cause pollution.



Jaguar Land Rover Land Rover Jaguar

# Supply chain

Jaguar Land Rover spent approximately £4.5 billion with more than 2,200 suppliers in 2010 – the majority with production suppliers that provide the materials, components and equipment we need to make our vehicles. We also purchase goods and services from other suppliers to support our operations, including transportation of parts and products, marketing and IT.

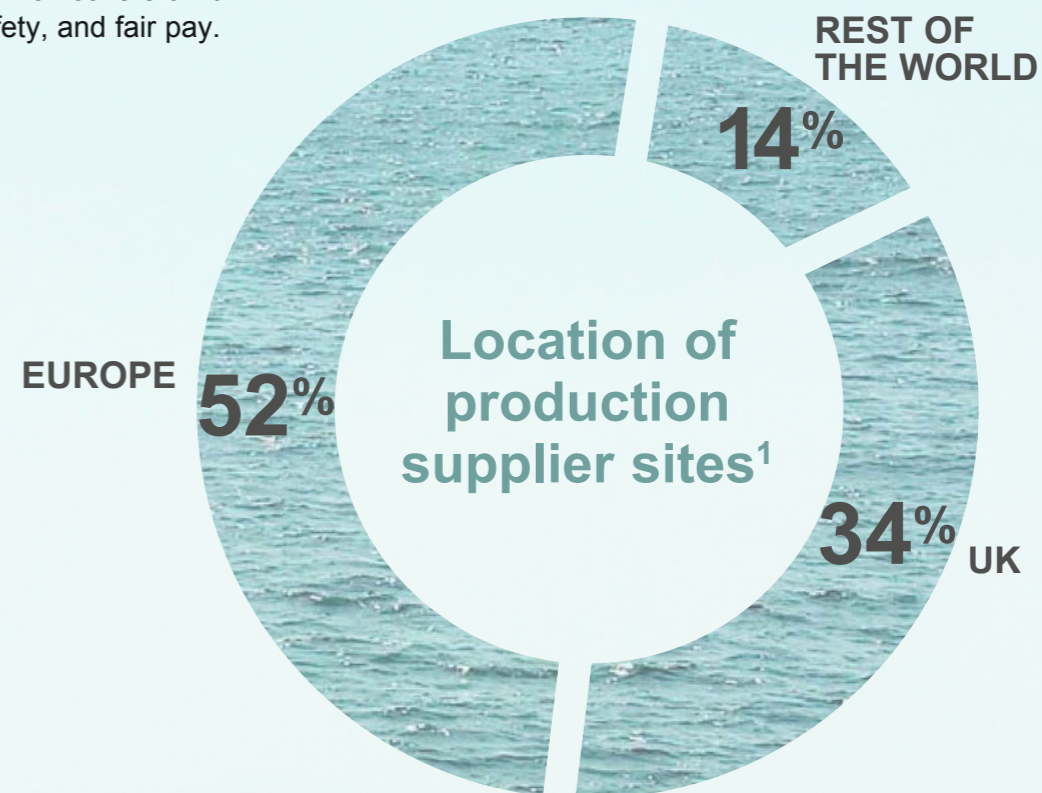
We depend on our suppliers to provide the products and services we need to run our business. Working with them can help us reduce the sustainability impacts from the lifecycle of our vehicles, and ensuring they operate responsibly reduces associated risks to our reputation.

Around 34% of our production suppliers' sites are in the UK and a further 52% are in other European countries<sup>1</sup>. The proportion of supplier sites outside Europe (currently 14%) will grow as Jaguar Land Rover, like other companies in the automotive industry, increasingly sources goods from emerging markets to obtain better value throughout the supply chain. We recognise that these markets may not always have the same level of regulatory standards on sustainability than in more established markets and we have dedicated procurement teams in China and India to develop supplier capabilities in these regions.

<sup>1</sup>Based on 2007/08 data

## Supplier requirements

We have robust systems in place to manage social and environmental risks across our supplier base. Sustainability requirements form an integral part of Jaguar Land Rover's Global Terms and Conditions for all suppliers, together with the accompanying environment and social guides. These require minimum legal and regulatory compliance, and adoption of our Code of Basic Working Conditions which covers child labour, human rights, health and safety, and fair pay.





In addition, production suppliers must achieve third party accreditation to environmental management standard ISO 14001. Manufacturing suppliers must also:

- **Comply with our comprehensive list of prohibited and restricted substances**
- **Report substances of concern, which are logged in our materials database to help us understand how these are being used in our products and assess potential alternatives**
- **Follow our guidelines on use of renewable or recycled materials, reusable packaging, and recyclability at end-of-life.**

In 2010, we created a new set of Supplier Environmental Requirements that bring together all existing requirements and emphasise our goal to reduce impacts throughout the lifecycle of our products.

## Assessing compliance

New suppliers must complete a self assessment against our Jaguar Land Rover Quality (JLRQ) standard, which includes sustainability criteria. We conduct a site assessment to check the information provided is accurate before they can qualify as a Jaguar Land Rover supplier.

Our engineers visit production supplier sites regularly to assess compliance with quality and sustainability requirements. They concentrate particularly on sites where issues have been identified or those that are critical to the launch of a new vehicle. We provide advice and training for suppliers to support them in achieving or maintaining the JLRQ standard if required.

We focus our audits on the suppliers we deal with directly, but we expect them to cascade our requirements to their own suppliers. This is one of the criteria for ISO 14001 accreditation.

## Cutting environmental impacts from our supply chain

We work with suppliers to help them operate more sustainably, focusing on those with the biggest impacts – mainly production and logistics suppliers.

In 2010, we began a four-year plan to cut carbon emissions from the supply chain phase of our products' lifecycle. We have asked our suppliers to nominate a dedicated environmental champion and to collect carbon emissions data. To support our local supplier base in the UK, we have piloted a carbon reduction assessment approach with seven suppliers, working with Advantage West Midlands and the Manufacturing Advisory Service. The study identified opportunities to cut emissions and reduce their exposure to energy cost fluctuations.

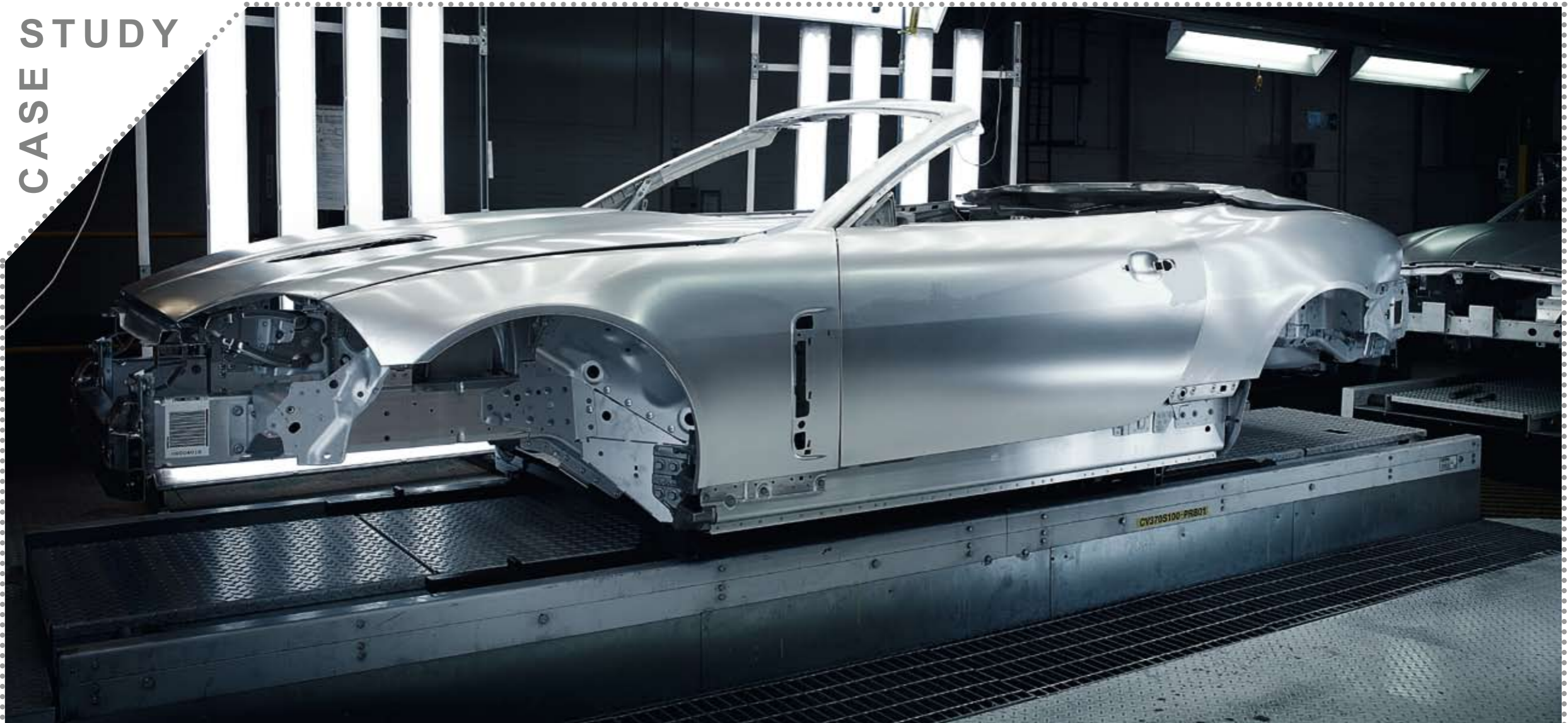
We will now work with a number of key suppliers to conduct a lifecycle assessment of climate impacts for parts supplied to Jaguar Land Rover. Ultimately, we aim to integrate the cost of carbon into our assessment of suppliers' value for money.

## Our responsibility to suppliers

Strong relationships with our strategic suppliers are essential to our business. To build these relationships and ensure continuity of supply, we have provided support, and direction to external assistance, to our supplier partners during the economic downturn.







# Changing suppliers for Jaguar XK casting cuts lifecycle emissions by a third

In 2009, we conducted a pilot lifecycle assessment (LCA) to compare the different carbon footprints of a vehicle part – body structure castings used on the Jaguar XK – when provided by the existing supplier and a potential new supplier.

The initial reason for considering a change of supplier was to explore ways to cut costs, but the LCA confirmed our decision by demonstrating significant emissions savings as well.

Jaguar used the recognised GaBi model to conduct the LCA of different manufacturing processes and sourcing options. One of the key differences between the suppliers was a new heat treatment process used in manufacturing the body structure castings. Energy use and related emissions from this process are significantly lower.

Overall, carbon savings of 4% were achieved through process optimisation and changing the type of aluminium used saved a further 28.5%. This means sourcing the body structure castings from the new supplier cuts emissions from its lifecycle by a third.

The study also showed that although the new supply chain had a longer logistics route, the carbon footprint was still lower as a result of improved packing density and less energy use in the smelting process. We will use these findings to develop a tool to help us make more informed decisions about future sourcing options.





# Our people

Our people are central to everything we do. We rely on a passionate and engaged workforce for the continued success of our business.

Jaguar Land Rover is committed to being a responsible employer. Our number one priority is to protect the health and safety of our employees, and to promote their wellbeing. We offer employees training opportunities and the chance to develop new skills, competitive pay and benefits, and flexible working options to help them balance work and family commitments.

Our workforce is comprised of salaried staff and hourly-paid production workers. Jaguar Land Rover employs nearly 15,000 people in the UK, around 58% of whom are hourly paid and work at our vehicle production plants. We work hard to retain our talented staff and to maintain our relatively low employee turnover of 0.32% for hourly and salaried staff combined.

## Restructuring

In 2009, our production volumes declined significantly as a result of a drop in demand during the economic downturn.

We took a number of steps to prevent redundancies among our production staff, including a company-wide two-year pay freeze, changes to shift patterns, and transfers of production staff between plants. By retaining our existing production workforce, this not only avoided loss of jobs, but also put the company in a much stronger position to increase production volumes as demand picked up again in 2010.

## People profile

- **14,605 employees in total (42% salaried and 58% hourly paid)**
- **0.32% turnover rate in 2009**
- **40% reduction in lost time incidents in 2009 compared with previous year**
- **Nearly 90% of employees had an appraisal in 2009**
- **15,477 training days provided in 2009**

# Health, Safety and Wellbeing

The health, safety and wellbeing of our people is paramount. We have systems in place to identify, assess and control the risks inherent in manufacturing and product development operations to help prevent injury and ill health.

All employees must comply with our Health and Safety Policy, which outlines the measures we take to reduce risks, and managers are responsible for overseeing implementation of the policy. Senior managers, employees and safety advisors receive regular updates on health and safety performance, and all have a role to play in implementing our health and safety management system.

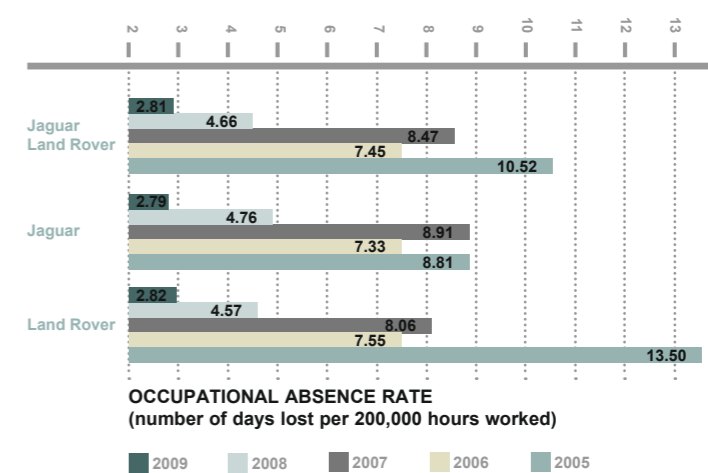
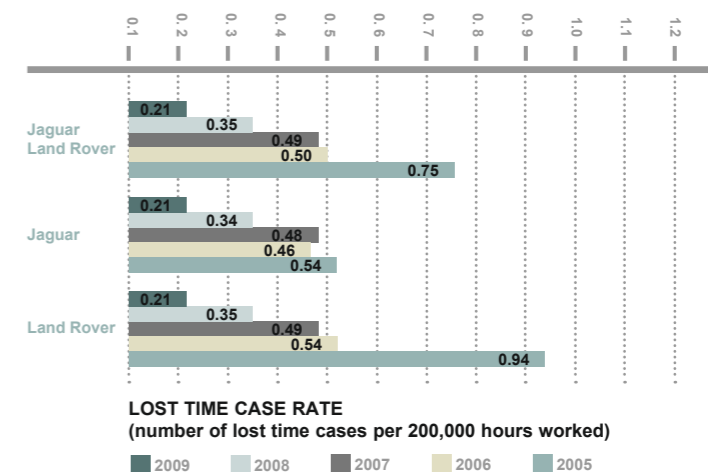
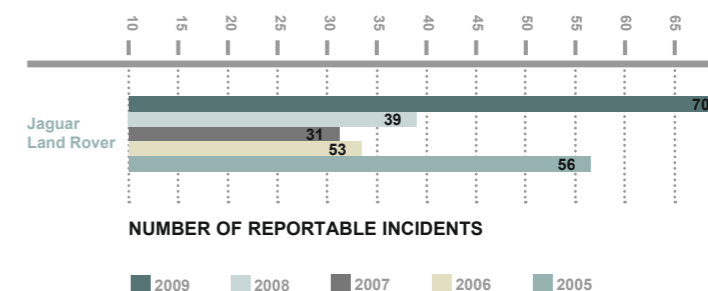
## Health and safety management

Our robust health and safety management system is based on the UK Health and Safety Executive's HSG 65 Standard for Successful Health and Safety Management. We are working to achieve the international health and safety certification standard, OHSAS 18001, at all our sites, with the first stage of the certification process completed in 2010.

We have a rigorous risk assessment process to identify potential new hazards, and ways to eliminate them, at the earliest opportunity. Site safety teams meet regularly to discuss any new risks or safety measures, and monitor performance using our 'safe behaviour index'. We also encourage production employees to get involved in identifying and addressing hazards themselves.

In the event of an accident, injured employees must go straight to the on-site occupational health centre to receive first aid, or to hospital if needed. We have an ambulance vehicle at most sites for use in an emergency.

All incidents are investigated and control measures are implemented where necessary to prevent similar incidents in the future. We inform the UK Health and Safety Executive (HSE) of any reportable incidents, and comply fully if the HSE decides to conduct its own investigation.





## Raising awareness

All employees receive health and safety training as part of their induction when they join the company, and we keep them up-to-date by:

- **Distributing weekly health and safety briefings, and a quarterly occupational health and safety information bulletin, to all employees**
- **Issuing a specific safety brief in response to any significant incidents that occur**
- **Posting health and safety information on dedicated safety notice boards at each site**
- **Running campaigns to raise awareness of specific risks or safety processes, for example in 2009, on the importance of isolating machinery during maintenance work.**

We also participate in awareness-raising campaigns led by the UK Health and Safety Executive and the European Agency for Safety and Health at Work. Jaguar Land Rover is playing a leading role in the new European Healthy Workplaces Campaign on Safe Maintenance.

## Performance in 2009

We set strict targets to improve health and safety performance, by around 10% year-on-year.

We have achieved a steady decline in both lost time incidents and occupational absences over the past five years (see charts). Across the business, both indicators are around 40% lower than 2008 and over 70% lower than 2005. This is largely as a result of measures we have introduced to help people come back to work sooner after an incident. For example, we offer people with a back injury the opportunity to work in a different, less physical role until they have recovered fully.

The most common types of injury are cuts and lacerations, strains and sprains. In 2009, we reported 56 serious incidents, recordable under the Reporting of Injury Diseases and Dangerous Occurrences Regulations

1995 (RIDDOR). We investigate all incidents to assess root causes and implement remedial measures. Two incidents were investigated by the UK Health and Safety Executive.

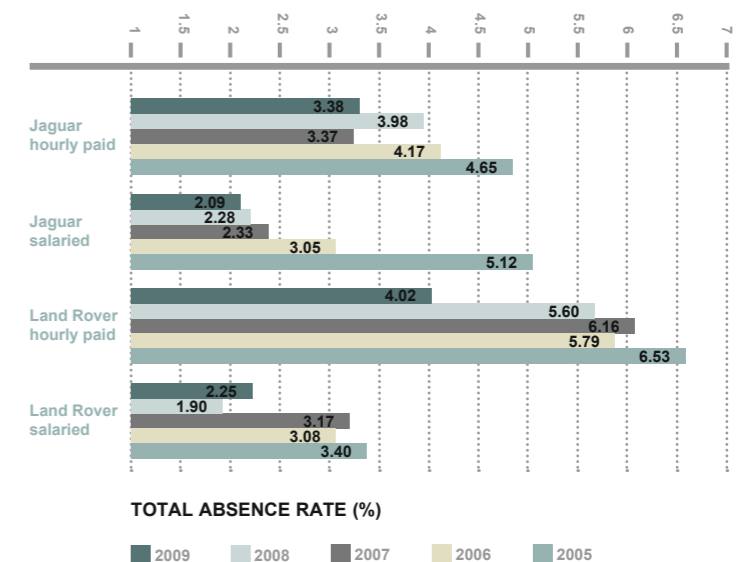
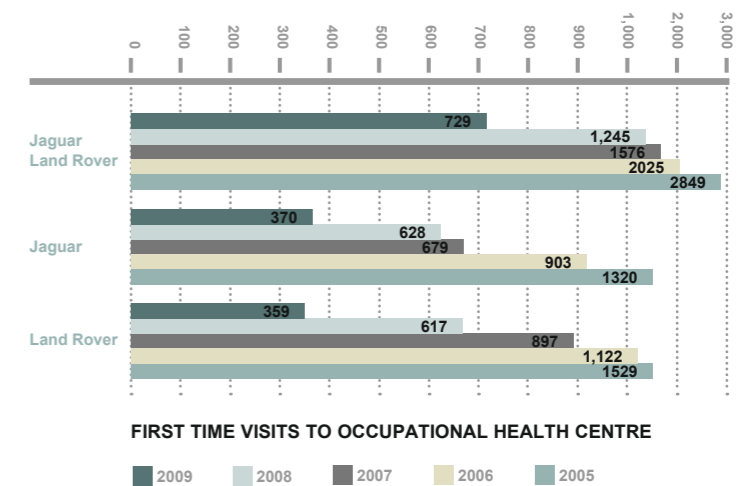
## Wellbeing

We offer a variety of initiatives designed to enhance the wellbeing of our employees to promote satisfaction, motivation and productivity. We are committed to helping employees live a healthy lifestyle, with a good work-life balance and in 2009, Jaguar Land Rover won the Working Families 'Family Friendly Employer' of the year award.

For example, we offer:

- **Flexible working options including job-sharing, part-time work, working from home, and variable hours where an individual's role allows**
- **A highly competitive maternity leave package of one year at full pay**
- **The option to request a career break of up to four years for employees who have been with the company for two or more years, for reasons ranging from childcare responsibilities to study and travelling**
- **Nurses at on-site occupational health centres to advise staff on maintaining a good work-life balance**
- **A free counselling service to all employees**
- **Physiotherapy to those who are recovering from injury**
- **On-site sports facilities to encourage employees to keep fit**

We also run health campaigns that focus on specific issues such as heart health and support to quit smoking. In 2009, we launched a tool on our intranet that gives people a quick and easy way to assess their current fitness level and design a training programme that meets their needs.





# Jaguar Land Rover wins award for best health and safety achievement in manufacturing

We won a 2010 Safety and Health Practitioner award, sponsored by the UK Institution of Occupational Safety and Health, for our efforts to place injured employees in new roles during the economic downturn.

If an employee is restricted in the work they can do as a result of work-related activity or other health issues, we do everything possible to adapt their role to meet their health needs. This posed a particular challenge during the 2009 economic downturn, when we temporarily transferred around 500 hourly paid staff from Land Rover's Solihull plant to help with production of the new Jaguar XJ at Castle Bromwich. Around a quarter of the transferred workers had some form of current or previous health issue that restricts the work they can do.

Solihull's human resources team put together a pack for each person that outlined previous jobs done, current medical conditions, and workplace adjustments required. This was reviewed by the team at Castle Bromwich, who identified a suitable and safe role for each and every worker.

The project helped our people work in suitable roles during the economic downturn, while at the same time supporting our business needs.





# Diversity

The wealth of backgrounds and experience offered by a diverse workforce is beneficial to our business and helps us understand the needs of our customers.

Jaguar Land Rover is committed to treating our employees with respect, regardless of age, disability, gender, race, religion or sexual orientation. We promote equal opportunities in the workplace, and our recruitment process is designed to be inclusive and ensure no one is put at a disadvantage.

We encourage everyone at Jaguar Land Rover to challenge unacceptable behaviour and report any incidents of discrimination. All employees must comply with our 'Dignity at Work' policy, designed to prevent harassment, bullying and victimisation. This is included in induction training for new starters. Our Diversity and Inclusion Council oversees implementation of the policy and diversity champions sit on each of our People Development Committees. We train diversity champions on the business case for diversity and how to challenge stereotypes and prejudice.

Our annual Diversity and Inclusion Awards recognise employees' best practice in promoting diversity, within and outside the business.

## Gender

The automotive industry traditionally attracts more men than women. We are working to increase the number of women working at Jaguar Land Rover, and offer a range of initiatives to help employees balance work and family commitments (see page 51). In 2009, women represented 8% of our employees, including 12% of managers and 1% of senior managers.

We launched a leadership training programme for women in 2009, with support from the UK government, to help more women reach senior roles. More than 80 women have already completed the training, which includes coaching and workshops on leadership skills and career development planning, and a further 40 have signed up in 2010.

Our graduate recruitment process encourages female students to consider a technical career at Jaguar Land Rover. In 2009, for example, some of our female engineers visited Aston University to talk to students about working in the industry. We also encourage female apprentices to speak in local schools about their experience of working with us.

In 2010, Jaguar Land Rover is sponsoring the Institute of Engineering and Technology Young Woman Engineer of the Year Award, which honours the UK's best female engineers under the age of 30.

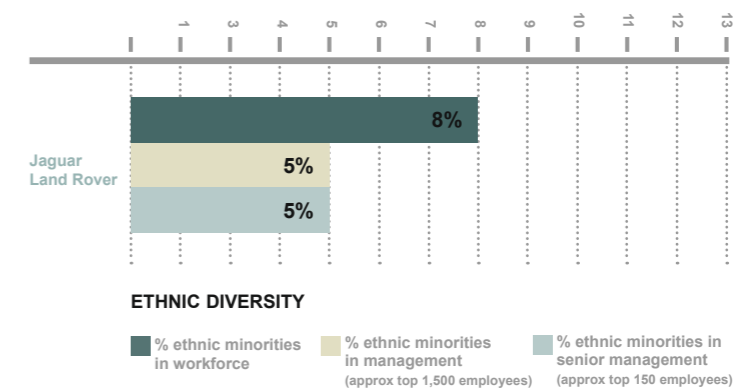
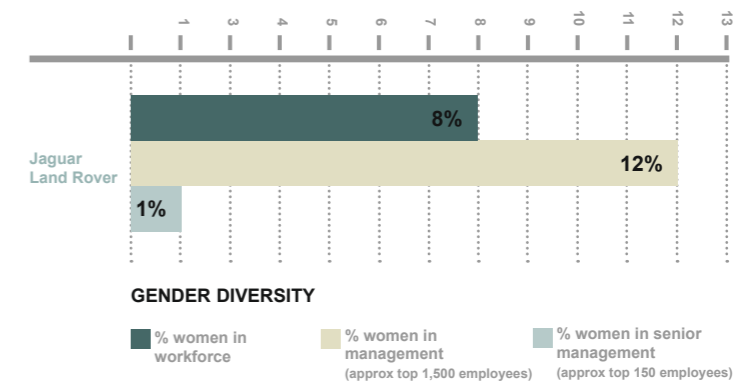
## Ethnic minorities

Around 8% of our employees are from ethnic minorities (defined as non-white British). This includes 5% of our managers and 5% of senior managers.

## Disability

Jaguar Land Rover has been awarded the 'two ticks' disability badge by Jobcentre Plus in recognition of our commitment to employ, retain and develop people with disabilities.

All our sites have an occupational health department that gives support to employees with disabilities and those who are recovering from injury. Our recruitment centres are designed to be accessible to people with disabilities and we will make any adjustments necessary to meet their needs.



# Training and development

Our aim is to attract and retain the most talented, motivated people by offering them with the opportunities they need to develop a long-term, fulfilling career at Jaguar Land Rover.

We provide each employee – salaried and hourly paid – with training and development opportunities tailored to their role and the needs identified through our personal development assessment process. Our graduate development programme and advanced apprenticeship scheme provide the future talent and skills the business needs (see page 62).

## Appraisals

Our aim is for every Jaguar Land Rover employee to have an annual appraisal, with an interim review halfway through the year. In 2009, around 90% received an appraisal.

For salaried employees, appraisals are designed to measure an individual's performance against objectives set at the start of the year and their ability to express our corporate values and behaviours. They provide an opportunity for employees to get one-to-one feedback from their managers, discuss any issues that have arisen, and identify areas for development.

Our personnel development committees use findings from appraisals to match the skills and potential of individuals with new or vacant positions within the company. This helps people gain diverse experience and develop valuable new skills by enabling them to try new roles.

For hourly paid production employees, appraisals are used to assess each individual's contribution to quality, safety and teamwork, as well as production volume. The discussions also help us identify the training and career development needs of each individual.

## Training

In 2009, we provided employees with a total of 15,477 days training. This includes courses on health and safety, management and leadership, and personal and technical skills.

We have developed a new leadership training programme for middle and senior managers, run by an external business school. All managers will complete the 10-12 day programme by the middle of 2011.

## Further education

We support employees who choose to take part-time courses to obtain degrees or professional qualifications relevant to their work.

For example, in 2008 we established a programme that funds selected Jaguar Land Rover employees to complete a three-year, part-time degree at either Coventry University or Liverpool John Moores University. Some individuals also complete specific advanced degree programmes that are directly related to their area of expertise.

Around 50 Jaguar Land Rover employees studied for full degrees in 2009 with another 50 commencing in 2010.



# Employee engagement

We engage regularly with employees to inform them about our company strategy, discuss changes to the business that may affect them, and get their feedback about our performance as an employer to identify ways we can improve.

All salaried employees have the opportunity to take part in an annual survey about their experience of working for Jaguar Land Rover. The survey includes more than 40 questions on a wide range of topics from management and quality of work to safety, training and diversity. The findings guide our development of company policies and practices, and enable us to monitor staff morale through an Employee Satisfaction Index (ESI).

The ESI is based on employees' responses to eight questions that cover topics such as reward and recognition, training opportunities, and satisfaction with the company. In 2009, 74% of employees took part in the survey, and we achieved an ESI rate of 56%. Local survey results are shared with managers to enable them to identify and target areas for improvement.

Other engagement methods we use include:

- **A quarterly leadership conference that brings together the top 150 senior managers from across the business. In 2009, one of these events focused on our new Environmental Innovation strategy (see page 11)**
- **Events where we present information on our business performance to employees**
- **Meetings between Board members and their functional staff, to discuss strategic progress and assess employee engagement with the leadership team and the business as a whole**
- **The intranet, weekly plant newsletters and our 'Team Talk' employee magazine**
- **Competitions such as the Environmental Innovation awards introduced in 2010 (see page 38)**
- **Internal product launch events, road shows and training sessions, open days, vehicle test drive events and family days.**

To diversify our employee engagement, and encourage greater interaction, we are developing better online employee communications, including a company You Tube page, intranet forums, blogs and webcasts to be introduced in 2011.





## Motor-vating Land Rover staff

Land Rover introduced the 'Motor-vate' initiative in 2005, to encourage good attendance at work. If absenteeism is cut by 0.25% or more in a three-month period, we offer incentives.

Land Rover employees with 100% attendance during those three months are entered into a prize draw to win a vehicle. A Land Rover vehicle and cash contributions are also given to a community organisation chosen by employees. Since the initiative began we have donated funds and vehicles to local causes, including the air ambulance, bereavement charities, junior football clubs, schools for people with learning difficulties, scout groups and senior citizens associations.

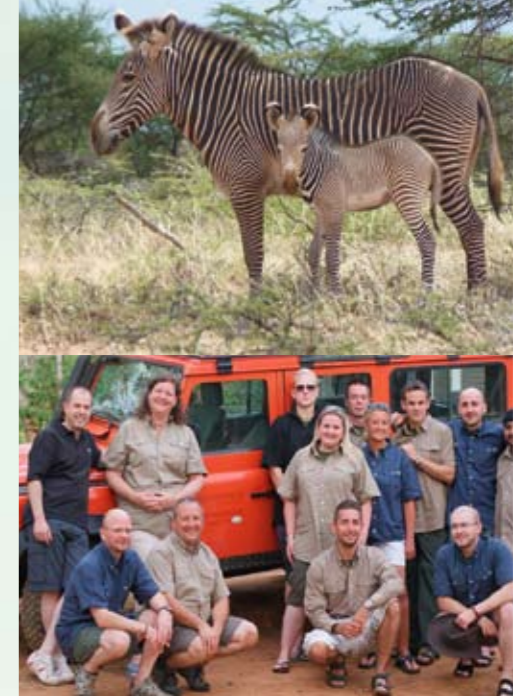


## Environmental volunteering with Earthwatch

Employees from across the business have the chance to protect nature first-hand, through Land Rover's partnership with environmental charity Earthwatch (see page 64). Earthwatch runs research expeditions in 30 countries that help to protect threatened species, study the effects of climate change, and support rural communities.

Going on an expedition enables staff to experience conservation work first-hand, and teaches them new skills that they can bring back to work with them.

In 2010, 12 Jaguar Land Rover employees joined a 10-day expedition to the Samburu Field Centre in Kenya, where they worked alongside scientists to assess the health of the local environment and identify ways to improve community livelihoods. Participants worked as field assistants, learned about environmental issues and developed leadership and teamwork skills.





# Union consultation

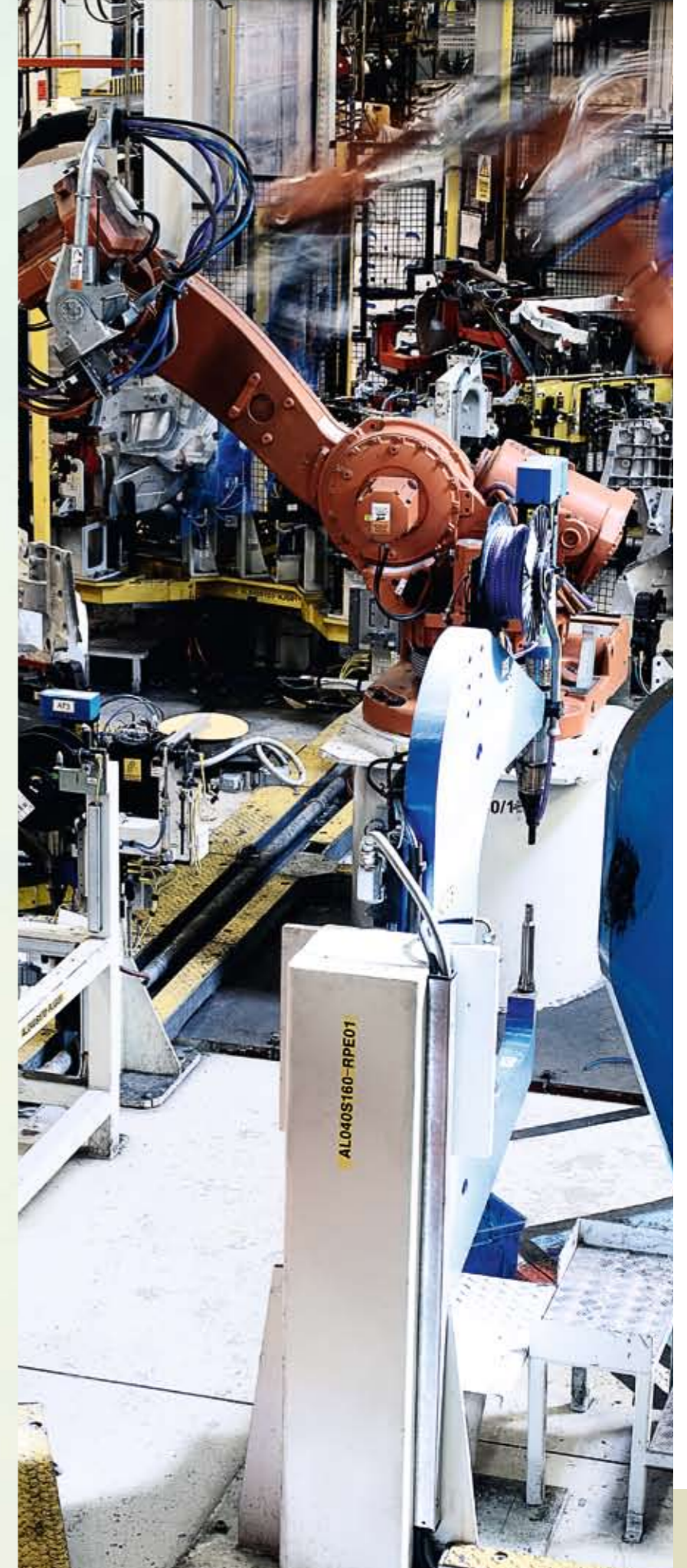
The UK automotive industry is heavily unionised. Around 65% of Jaguar Land Rover employees belong to one of our recognised trade unions: UNITE, T&G and GMB. This includes nearly all our hourly paid production employees (over 96%), and around 62% of our salaried staff.

We consult with recognised trade unions on key changes to the business, and negotiate with them on pay, terms and conditions for our employees. Negotiations involve three separate bodies within the company: the Jaguar Salaried Negotiating Committee, Jaguar Joint Negotiating Committee and Land Rover Joint Negotiating Committee.

Traditionally, we agree a two-year pay deal with the unions. Proposed deals go to a workplace ballot, and are implemented if the majority agree.

The most recent pay and conditions agreement for Jaguar Land Rover hourly and salaried employees (A-C grades) was unanimously recommended to the workforce by the company and trade unions in October 2010, and implemented with effect from 1st November 2010 following a 'majority in favour' ballot. The agreement secures the future of all three vehicle assembly plants in the UK and lays the foundations for significant employment growth over the next decade, as production increases.

Our grievance procedure meets Advisory, Conciliation and Arbitration Service (ACAS) guidelines. If an employee raises a concern or grievance with their union, the first step is an initial discussion with their line manager. If the issue remains unresolved, it is elevated to the area manager, then the plant's human resources manager, and finally to the Joint Negotiating Committee if necessary.





# Community

Our business plays an important role in local communities, providing employment opportunities both at Jaguar Land Rover and indirectly through our suppliers. We support education initiatives to promote careers in the automotive industry and invest in the next generation of engineers and designers. We contribute to local charities in cash and in kind, and encourage employees to get involved by volunteering their time.

All our sites have a community liaison committee responsible for collaborating with local authorities, non-governmental organisations and other local businesses to coordinate volunteering activity, community investment and fundraising.

Being a responsible neighbour by minimising noise or disruption from our operations is a priority and we engage with local council members and residents' groups regularly to address any concerns. We route transport of parts and finished vehicles on major roads and motorways wherever possible and promote employee car-sharing to reduce congestion on local roads.





# Investing in local communities

Supporting local schoolchildren – Work experience opportunities for 14-16 year olds are available at all Jaguar Land Rover sites, with over 300 young people taking part each year. These placements give them the chance to learn about careers in engineering and manufacturing, and about how to run a business.

In addition, every year 250 of our employees' children aged 12-14 attend our Sons and Daughters to Work Day, to sample a day working alongside their parents. They learn about careers in the motor industry and experience a drive on our test track.

We also encourage employees to support a local school or college by volunteering as school governors, mentoring, making presentations on business issues and engineering, and helping with science projects. Over 150 employees do so each year.

In collaboration with Business in the Community through its Business Class initiative to create long-term partnerships between schools and businesses, we are supporting the Sidney Stringer Academy in Coventry and the Lyndon School Trust in Solihull. Jaguar Land Rover staff act as governors of these institutions' trusts and will lead the development of courses on automotive design and technology, and business related subjects.

Through a partnership with education authorities in Birmingham, Coventry, Liverpool, Solihull and Warwickshire, we have established five Education Business Partnership Centres to provide learning facilities and resources for schoolchildren. Around 17,500 young people and nearly 2,000 teachers visited the centres in 2009 to learn about engineering, manufacturing and the automotive industry – 85% of whom came from communities less than 30 miles away. We are promoting the centres widely to increase the number of young people visiting them to 20,000 per year.

In 2009, we partnered with other automotive, engineering and academic organisations to run three schools challenge competitions for schools across the UK to support the national Campaign to Promote Engineering. Challenges raise awareness of the career opportunities available in engineering and the automotive industry, and enable students to develop important communication, teamwork, project management and IT skills in a fun and educational way.

Around 150 young people took part in the Land Rover 4x4 in Schools Technology Challenge to design and build a radio-controlled, four-wheel drive model vehicle and over 200 participated in the Jaguar GT in Schools Design Challenge to design and manufacture a model racing car (see page 62). We aim to increase the number of students participating in these competitions by 10% year-on-year. Nearly 100 students from 36 schools took part in the final of Jaguar's annual Maths in Motion Challenge at our Heritage Motor Centre in Gaydon.





## University and college collaborations

We have established strategic research and teaching links with UK universities that have a good reputation for science and engineering. For example, we work closely with Warwick University's Manufacturing Group to run education programmes and conduct research, and we fund 4 scholarships a year at Coventry University for children of Jaguar Land Rover employees. For 5 years up to 2008 we also worked with Warwick's Manufacturing Group on the Premium Automotive Research and Development partnership, and continue to use the training courses and other outputs that emerged from this collaboration.

In September 2010, we launched the Jaguar Land Rover Technical Accreditation Scheme with Coventry, Cranfield, Loughborough and Warwick universities to deliver technical courses relevant to the automotive industry. Topics will include powertrain design, hybrid vehicles, computer simulation, electronics, and sustainable product design. Engineering students can take courses separately or combine them to gain a Masters qualification. Our own engineers' participation in the programme will help us develop sustainable products and low carbon technologies for the future. Courses will also be open to employees of our suppliers, and other component manufacturers.

We recruited 57 engineering and business graduates to take part in our graduate development programme in 2009 and 130 joined in 2010. We also offer approximately 30 product development placements for engineering undergraduates each year, for a period of either 3 or 12 months.

## Apprenticeships

Apprenticeships give young people the chance to take their first step on the path to a career in manufacturing or engineering.

Our advanced apprenticeships last for around 3 years, including an initial period studying at college. Apprentices gain a qualification in engineering, as well as technical certificates. In 2009, we took on 31 advanced apprentices, most from local communities, with a further 38 starting in 2010. 13 more joined us each year as part of our Apprenticeship Expansion Programme which supports smaller engineering and manufacturing businesses by training people who go on to work for other local companies.

In 2009, 90 young people took part in our Young Apprenticeship Programme, certified by the Institute of Motor Industry. A further 125 joined in 2010. The programme gives students aged 14-16 from 10 local colleges the chance to gain work experience and a qualification equivalent to 5 General Certificates of Secondary Education (GCSEs). Participants spend 50 days at Jaguar Land Rover, learning about careers in the automotive industry. We are the only automotive manufacturer sponsored by the UK government to offer this vocational qualification.

## Jaguar GT in Schools Design Challenge

Building a racing car isn't something school children do every day. The annual Jaguar GT in Schools Design Challenge gives them the chance to do just that by designing a model version.

The competition is aimed at 12-18 year olds in schools across the UK. During the course of a year, students research racing car technology, then design and manufacture their model vehicle using automotive industry processes and computer software. The finished products go head-to-head in a race against vehicles designed by teams from other schools.

Over 200 young people took part in 2009 and the winners – from a school in Northern Ireland – were rewarded with a visit to the Jaguar XK production facilities and vehicle design studio, and the Jaguar Land Rover Heritage Motor Centre.

We run the GT Challenge in partnership with leading engineering and education organisations, including the Institute of Engineering, the Science, Technology, Engineering and Mathematics Network, and the Assessment and Qualifications Alliance.







# Charity support

Jaguar Land Rover donated £1.3 million to charities in cash and in kind in 2009. For example, we give 65 pence for every vehicle sold to BEN, a charity that supports people who work in the UK automotive industry and their dependants in times of need. We also donated a vehicle for auction at the charity's annual fundraising dinner.

Jaguar has supported the National Society for the Prevention of Cruelty to Children (NSPCC) since 1996 and signed up to the NSPCC national Child's Voice Appeal in 2010 to help the charity raise £1.5 million by 2013 by hosting fundraising events across the UK in collaboration with Jaguar dealers. Jaguar also chairs the NSPCC's Coventry and Warwickshire Business Group and has raised around £2 million for the group over the past 14 years.

Land Rover focuses much of its support on international conservation and humanitarian organisations which find its all-terrain vehicles invaluable in remote regions of the world (see case study). Land Rover also loans vehicles to local charities and organisations, who need them to cross rugged terrain.

Employees can make personal donations to charity through our payroll giving schemes. Around 10% of staff chose to contribute in this way, collectively donating £34,000 in 2009, which the company matched to make a total of £68,000.

## JAGUAR LAND ROVER COMMUNITY CONTRIBUTION IN 2009

Charitable giving donations	<b>£295,500</b>
Employee volunteering time	<b>£256,000</b>
Management costs	<b>£240,000</b>
In kind (use of buildings, vehicles, etc)	<b>£550,000</b>



## Land Rover vehicles facilitate conservation and humanitarian work worldwide

The all-terrain capability of Land Rover vehicles makes them the perfect partner to charity workers around the world. Supporting conservation and humanitarian partnerships is one of four pillars of Land Rover's "Our Planet" approach to sustainability. See [www.landrover.com/ourplanet](http://www.landrover.com/ourplanet) for details.

Land Rover has long-standing collaborations with five international conservation partners, which include vehicle donations. These partnerships play a vital role in supporting nature conservation projects worldwide:

**Biosphere Expeditions**, which enables ordinary people to work alongside scientists on overseas conservation projects that improve understanding of species and habitats.

**Born Free Foundation**, a wildlife charity that works to protect threatened species in the wild and prevent animals from suffering in captivity.

**China Exploration and Research Society**, which helps to preserve fragile environments and endangered wildlife in remote regions of China.

**Earthwatch**, an international environmental charity that supports scientific field research worldwide.

**Royal Geographical Society**, a body of academics and professional geographers that aims to advance geographical learning.

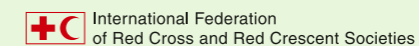
Land Rover vehicles also help the International Federation of Red Cross and Red Crescent (IFRC) respond instantly to emergencies and get aid to people in remote areas. We have supported this organisation with vehicles and donations since 2007, contributing over £2.5 million in cash and in kind.

In 2010, Land Rover and the IFRC launched a new three-year global initiative, called 'Reaching Vulnerable People Around the World'. The programme will assist national Red Cross and Red Crescent societies in 15 countries, with our support focused primarily on humanitarian aid programmes in Sierra Leone and China.

Land Rover and its employees contributed a total of £10,000 to the IFRC disaster appeals in 2009, following disasters in the Asia Pacific region, Haiti and Pakistan. Land Rover is developing a company-wide UK disaster response protocol that will enable us to react even faster in the event that the British Red Cross or UK emergency services launch an appeal for help. emergency services launch an appeal for help.



IN SUPPORT OF





# Employee volunteering

We encourage employees to support their local communities by volunteering on community projects. This also helps them develop teamwork and leadership skills.

We work with local authorities and the Business in the Community CARES programme – a national campaign to encourage employee volunteering – to identify projects that need support, and employees can also nominate their own.

Each employee can volunteer for up to 16 hours of work time per year. In 2009, over 350 employees volunteered for a total of 6,200 hours. Focus areas included regeneration of the local area, mentoring young people, charity work and fundraising. For example:

- **Members of our market research team planted trees and hedgerows at a National Trust house in Shropshire**
- **Engineers from the Supplier Technical Assistance department helped rejuvenate a neglected recreation area at a Warwickshire drug rehabilitation clinic**
- **A team from the Solihull plant created an outdoor education centre and orienteering course at a residential school for children with learning difficulties.**

In 2009, over 150 employees volunteered at schools to help students with reading, mathematics, science and business studies, provide careers advice and guidance on completing application forms for industry, and conduct practice interviews.





# Performance summary

		2009	2008	2007	2006	2005
<b>Responsible products</b>						
<b>Fleet average CO<sub>2</sub> emissions per kilometre (g/km)</b>	EU	228	236	240	243	n/a
<b>Responsible operations</b>						
<b>Energy</b>	Total energy use (GWh)	940	1,213	1,294	1,336	1,476
	Energy used per vehicle produced (MWh/unit)	5.92	4.63	4.45	5.12	5.40
<b>Emissions</b>	Total CO <sub>2</sub> emissions (thousand tonnes)	256	327	349	351	380
	CO <sub>2</sub> emissions per vehicle produced (tonnes per unit)	1.61	1.25	1.20	1.34	1.39
<b>Waste</b>	Total waste (thousand tonnes)	14.1	23	21.8	21.2	23.7
	Waste per vehicle produced (kg/unit)	89.07	87.94	74.97	81.34	86.49
	Total non-hazardous waste recycled (tonnes)	6.49	10.08	7.38	10.10	6.69
<b>Solvents</b>	Total solvents used at manufacturing sites (tonnes)	1,068	1,227	1,394	1,152	1,357
	Solvents used per vehicle produced (kg/unit)	6.7	4.7	4.8	4.4	5
<b>Water</b>	Total water use (thousand m3)	888	1,203	1,210	1,270	1,431
	Water use per vehicle produced (m3/unit)	5.60	4.60	4.16	4.86	5.23
<b>Our people</b>						
<b>Employment development</b>	Number of employees	14,605	14,975	15,135	16,243	16,715
	Number of days training provided	15,477	n/a	n/a	n/a	n/a
<b>Health, safety and wellbeing</b>	Number of reportable incidents (under RIDDOR)	56	53	31	39	70
	Lost time case rate (number of lost time cases per 200,000 hours worked)	0.21	0.35	0.49	0.50	0.75
	Occupational absence rate (number of days lost per 200,000 hours worked)	2.81	4.66	8.47	7.45	10.52
	First time visits to occupational health centre	729	1245	1576	2025	2849
<b>Diversity</b>	% women in workforce	8	n/a	n/a	n/a	n/a
	% women in management (approx top 1,500 employees)	12	n/a	n/a	n/a	n/a
	% women in senior management (approx top 150 employees)	1	n/a	n/a	n/a	n/a
	% ethnic minorities in workforce	8	n/a	n/a	n/a	n/a
	% ethnic minorities in management (approx top 1,500 employees)	5	n/a	n/a	n/a	n/a
	% ethnic minorities in senior management (approx top 150 employees)	5	n/a	n/a	n/a	n/a
<b>Community</b>						
<b>Charity support</b>	Amount donated (in cash and in kind) (GBP million)	1.3	1.4	1.3	1.3	n/a



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