



# Jaguar Land Rover Sustainability Report 2012/13





The data in this report relates to the financial year from April 2012 to March 2013, unless otherwise stated, and to all our manufacturing and product development operations in the UK. It excludes joint venture assembly plants outside the UK where complete knock down (CKD) kits of Land Rover components are painted and assembled. It also excludes the forthcoming joint venture manufacturing site in China, which is expected to open in 2015.

An index of conformance with the Global Reporting Initiative (GRI) indicators can be found on our website, together with previous years' reports at: [www.jaguarlandrover.com](http://www.jaguarlandrover.com).

# Contents

## Strategy



Transforming our products and our business operations through environmental innovation, investing in our people, advancing knowledge and supporting communities worldwide.

Introduction	5
CEO Statement	6
Key Achievements	7
Our Journey So Far	8
Global Challenges	9
Engaging Stakeholders	10
Our Strategy	11
Road to 2020	13
Embedding our Strategy	14

## Sustainable Products



Innovating to reduce environmental impacts, including CO<sub>2</sub> emissions, over the product life cycle.

Overview	17
At a Glance	18
Road to 2020	19
Our Product Strategy	20
Investing in Research	24
Designing for Efficiency	26
Sustainable Materials	35
Product Safety	36
Helping Customers	37

## Sustainable Operations



Demonstrating leadership in sustainable business practices in all our activities across the world.

Overview	39
At a Glance	40
Road to 2020	41
Environmental Impacts	42
Emissions Reductions	43
Using Resources	47
Sourcing More Sustainably	51
Transport Impacts	54

## Our People



Investing in our people and embedding sustainability into decision making.

Overview	57
At a Glance	58
Road to 2020	59
Changing Mindsets	61
Engaging Employees	62
Consulting Trade Unions	64
Developing our People	65
Valuing Diversity	68
Safe Environments	71
Putting Safety First	72
Health and Wellbeing	75

## Global CSR



Advancing the knowledge of young people through education partnerships, and improving the lives of millions of people through our community and CSR programmes.

Overview	77
At a Glance	78
Road to 2020	79
Advancing Knowledge	80
Improving Lives	85
Global Charity Support	88
Inspiring Employees	89
Performance Summary Table	90



# Our Strategy

Transforming our products and our business operations through environmental innovation, investing in our people, advancing knowledge and supporting communities worldwide



# Introduction

Welcome to our third Jaguar Land Rover sustainability report. Our business is driven by advanced design, technology and engineering, and we recognise that stakeholders expect our brands to reflect their aspirations for a more sustainable world.

This report presents a review of our progress to date and our performance in 2012/13, as well as introducing the new objectives that form the next evolution of our sustainability strategy to 2020.

## About Jaguar Land Rover

Founded on two iconic British car brands, Jaguar and Land Rover, we are the UK's largest premium automotive manufacturer.

Our business is growing. In 2012/13, we sold almost 375,000 vehicles globally – up 23% from the previous year – and generated £1.68 billion profit. We are a major exporter, with 80% of vehicles manufactured in the UK sold abroad.

Jaguar Land Rover is owned by Tata Motors Ltd. We employ 24,913 people in the UK and support around 190,000 more through our dealerships, suppliers and local businesses.

## Our brands and products

### Jaguar



XJ



XF



XK



F-Type

### Land Rover



Defender



Range Rover



Freelander 2



Range Rover Sport



Discovery 4



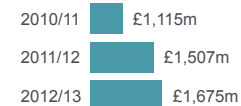
Range Rover Evoque

## At a glance

### Revenue



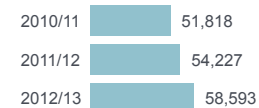
### Profit before tax



### Land Rover vehicles sold



### Jaguar vehicles sold



Find out more about our company and business performance in our [Annual Report](#).

# CEO Statement



As the UK's largest premium vehicle manufacturer, we are committed to providing experiences customers love for life, through great products, outstanding service, and embedding a passion for environmental innovation in our processes and behaviours.

Combining world class British design, technology and engineering sets us apart. We are committed to growing our business responsibly and sustainably and in doing so we are adding value to our customers, our company, the communities we are part of and the wider economy.

We have invested more than £2 billion in new vehicles, product creation and development of our facilities in 2012/13 to put us in a strong position for long-term growth. The All-New aluminium-bodied Range Rover is 39% lighter and has 26% lower tailpipe emissions compared with the outgoing model, and the hybrid version brings further improvements. Our new Engine Manufacturing Centre built to the highest sustainability standards will deliver low emission 4-cylinder engines. Our continued investment in research and focus on innovation is helping us reduce the environmental impacts of our vehicles across the life cycle.

Building on our progress to date, our sustainability strategy sets out our aspirations for 2020 in the areas where we can make the biggest difference. Inspiring behaviour change is critical to embed sustainability throughout our business, and we are continuing to engage and invest in our people to make sure they have the right skills and motivation to help us deliver our plans. We have made substantial progress in driving sustainable improvements across the business and I am extremely proud that our efforts have been recognised by Business in the Community with the award of Responsible Business of the Year in 2013. This is an outstanding achievement.

As we look ahead to more groundbreaking achievements on our path to sustainable growth, Jaguar Land Rover will continue to demonstrate leadership in responsible business and invest in cutting-edge, sustainable technologies. I look forward to updating you on further progress next year.

**Dr. Ralf Speth**  
CEO, Jaguar Land Rover

## Key Achievements

# Responsible Business of the Year 2013 Award (Business in the Community)

We are extremely proud to be named Business in the Community's Responsible Business of the Year in 2013. This prestigious award recognises our commitment to embedding sustainability across every aspect of our business and our significant achievements in a number of key areas, such as our attention to sustainability at each stage of our products' life cycle, developing relevant skills and interest in engineering among young people and our investment in research and technology for a more sustainable future.

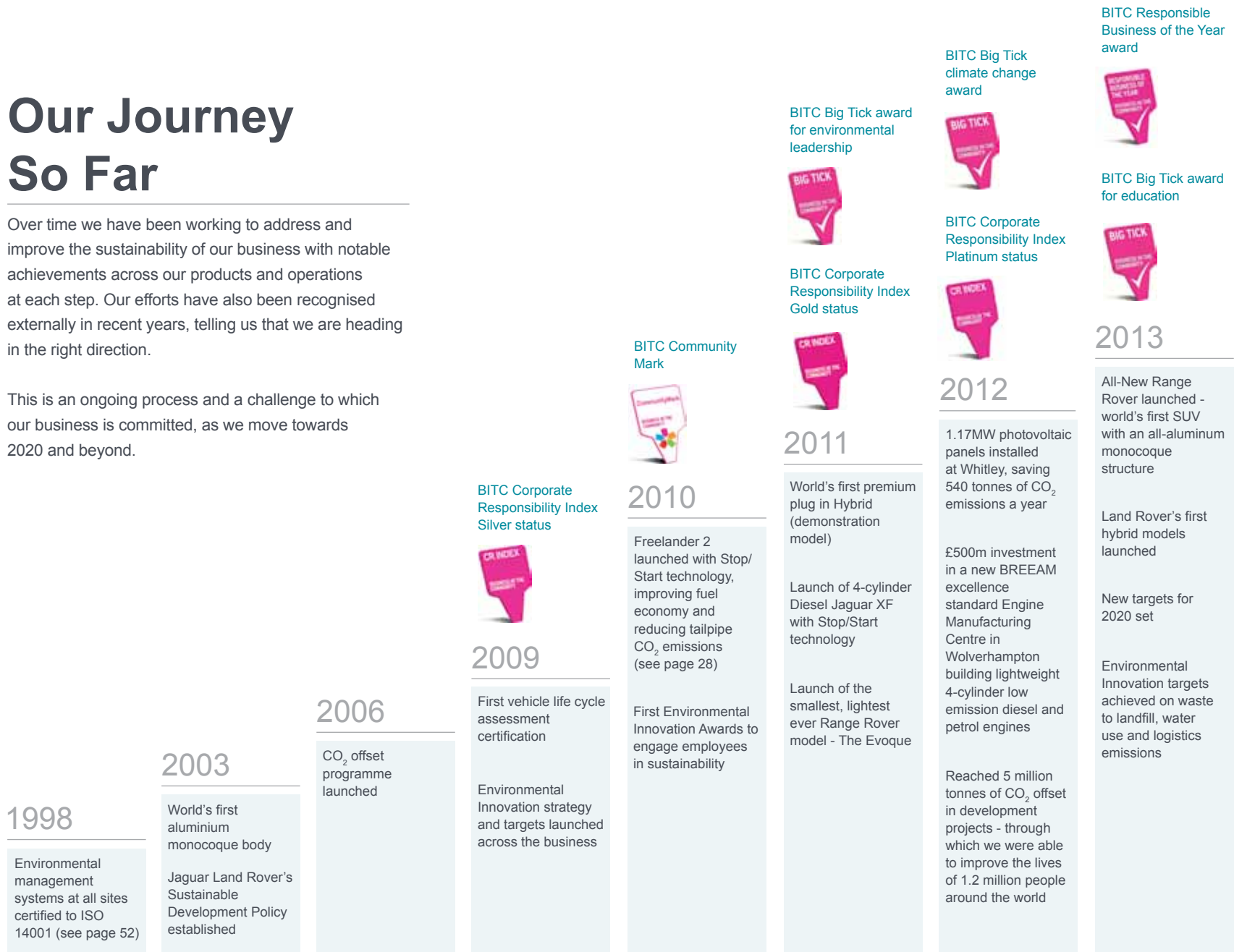
Receiving this accolade will drive us on to set and achieve more ambitious sustainability objectives, as outlined in our strategy for 2020.



# Our Journey So Far

Over time we have been working to address and improve the sustainability of our business with notable achievements across our products and operations at each step. Our efforts have also been recognised externally in recent years, telling us that we are heading in the right direction.

This is an ongoing process and a challenge to which our business is committed, as we move towards 2020 and beyond.





# Global Challenges

Recognising global challenges is integral to the development of our sustainability strategy as we balance the needs of our stakeholders and respond to a number of emerging global trends that are shaping the future of our business:



Global energy demand is predicted to increase by a third from 2010 to 2035, with energy-related CO<sub>2</sub> emissions increasing by 20% in the same period.



In emerging markets, fuel needed for transport could increase oil consumption by 15% from 2010 to 2035.



The global population is expected to reach 9 billion people by 2050 with almost all of the growth occurring in cities.



Up to 85% of this growth will occur in Asia and the middle class in emerging markets such as China and India will have greater spending power and car ownership.



Wealth patterns are changing with an expanding middle class, predicted to grow from 1.8 billion people worldwide in 2010 to 4.9 billion in 2030.



Demand is also outstripping supply for other increasingly scarce natural resources such as minerals and water.

**We are investing heavily in innovation, making existing technologies more efficient, and in the facilities that will enable us to make more low carbon, high performance vehicles that meet our customers' needs now and in the future.**

# Engaging Stakeholders

## Engaging Stakeholders

is key to ensuring that our strategy addresses the issues that are important to them, as well as helping us understand our sustainability impacts and how to tackle these.

### Opinion Formers

We find it useful to seek the views of 'opinion formers' on sustainability, such as sustainability experts, pressure group leaders, investors, and consumer representatives. We do this through face-to-face meetings to promote dialogue.

### Customers

Our marketing research function runs customer feedback sessions where customers express views on our products. Through our marketing and sales operations we have regular high-level meetings with importers and dealers to give and receive feedback on sustainability and other issues.

### NGOs

We engage with a range of NGOs to share our strategy and listen to their views. Jaguar Land Rover is a corporate member of the Forum for the Future, which we have been working with since 2000. The Forum acts as a 'critical friend' to Jaguar Land Rover, helping us to develop strategy on sustainability and to analyse our progress. We engage with NGOs to share our carbon reduction strategy and our sustainability aspirations.

### Policy Makers

We engage with a range of policy makers at UK and European level. We regularly meet with ministers, other parliamentarians, UK government departments, members of the European Parliament, and the European Commission. Jaguar Land Rover is a member of the Confederation of British Industry's Energy Committee and its Environmental Affairs Committee.

### Industry Organisations

Jaguar Land Rover is a member of Business in the Community (BITC) – an organisation that encourages companies to continually improve their impact on society. Through the Carbon Disclosure Project (see page 52) we report annually on our carbon emissions and carbon strategy. We are members of the Society of Motor Manufacturers and Traders, with whom we work on sustainability issues affecting our sector.

### Communities & Education

We have developed many long-term partnerships with local and regional educational authorities and universities, as well as other organisations. We work extensively with stakeholders such as the Confederation of British Industry, the Skills Funding Agency, Chambers of Commerce, and the Society of Motor Manufacturers and Traders to share information on skills, gender, the ageing workforce, and education, training and development. We work with local government in the areas surrounding our sites and hold regular community meetings to share and exchange information.



# Our Strategy

Our sustainability strategy takes a 360 degree, holistic view of our business and is underpinned by our corporate values of integrity, understanding, excellence, unity and responsibility.

With both our natural and social environments in mind, this strategy is based on what our stakeholders have told us are the most important issues to them, how we can best respond to global trends, and where we can have the biggest impact.

We are focusing on environmental innovation and collaboration to drive improvements in the sustainability of our products and business operations, and to optimise our social contribution through advancing knowledge and improving lives.

Changing the mindsets and behaviours of both our people and our customers will play a pivotal role in driving these forward.

We have set ambitious targets for 2020 and to help us achieve these, our strategy is supported by a roadmap (see page 13) which provides clear milestones for each area of the business, building on the progress we have already made to date.



## Our Strategy (continued)

We know that global pressures such as rising fuel and energy prices, resource scarcity and climate change will bring new challenges and opportunities for mobility in the long-term, particularly given the rapid population growth globally in urban areas. We are exploring the role Jaguar Land Rover can play in delivering sustainable mobility in this context, and how we can enhance our local and global communities in the process.

We are investing heavily in environmental innovation to make existing technologies more efficient, and in facilities that will enable us to make more low carbon, high performance vehicles that meet our customers' needs now and in the future.

Key focus areas include downsizing engines, investing in lightweighting and aluminium architectures, and developing alternative hybrid and electric powertrain technologies. Indeed, we are already putting these developments into practice with the launch of the lightweight All-New Range Rover and the Range Rover and Range Rover Sport hybrids, the development of Evoque\_e hybrid prototypes, and investment in a new Engine Manufacturing Centre (see page 50) that will specialise in advanced, lightweight, 4-cylinder low emission diesel and petrol engines.

Our business is growing and through this we are supporting the growth of a supply chain around the world – our sustainability strategy reflects and supports this global expansion.

We aim to advance the knowledge of 2 million young people by 2020, as well as developing our employees, to help us secure the right people, with the right skills to support our business. Worldwide, we aim to improve the lives of 10 million people by supporting a range of programmes that promote the social, environmental and economic wellbeing of communities.

We can only deliver this strategy with the support of our people. Therefore, we are committed to ensuring our employees are fully engaged with our sustainability objectives and passionate about helping us achieve them.



# Road to 2020: Sustainability Strategy

	Goal	Approach	Key Objectives
<b>Organisational Responsibility</b>	<b>Our people, customers and partners, aligned to and motivated by sustainability</b>	Inspire transformation in business thinking and behaviour to leverage the long-term value of a sustainable approach	<ul style="list-style-type: none"> <li>• Embed sustainability into business planning processes</li> <li>• Recognise and reward sustainable behaviours</li> <li>• Inspire employees with sustainability</li> <li>• Engage consumers through sustainable choices</li> </ul>
<b>Environmental Responsibility</b> Long-term sustainable growth	<b>Sustainable products</b>	Innovate to deliver more sustainable product and operational solutions, to benefit both the environment and long-term business	<ul style="list-style-type: none"> <li>• Innovate to deliver competitive tailpipe CO<sub>2</sub> emissions and fuel economy</li> <li>• Reduce product impacts over the life-cycle</li> <li>• Develop sustainable mobility solutions</li> <li>• Deliver sustainable infrastructure and operations</li> </ul>
	<b>Sustainable business operations</b>	Demonstrate leadership in this, throughout our operations and our supply chain	<ul style="list-style-type: none"> <li>• Reduce our CO<sub>2</sub> emissions and other greenhouse gases</li> <li>• Build resilience to both legislative and physical climate change impacts</li> <li>• Evaluate water impacts across our operations and improve water efficiency</li> <li>• Eliminate waste and improve resource efficiency</li> <li>• Partner with our suppliers to deliver sustainable procurement practices around the world</li> <li>• Reduce the environmental impacts of our logistics</li> </ul>
<b>Social Responsibility</b> Creating opportunities in our local and global communities	<b>Healthy skills and talent pipeline for tomorrow's workforce</b>	Advance knowledge, develop skills and nurture talent amongst young people through collaboration	<ul style="list-style-type: none"> <li>• Build long-term education partnerships in our communities</li> <li>• Develop design and technology skills for the engineers of the future.</li> <li>• Nurture talent and improve performance</li> </ul>
	<b>Prosperous local and global communities</b>	Improve lives, using Jaguar Land Rover expertise and resources, to help create opportunities for millions of people in our local and global communities	<ul style="list-style-type: none"> <li>• Develop our communities and our people through employee volunteering</li> <li>• Contribute to humanitarian efforts and nature conservation</li> <li>• Support global communities by investing in sustainable development projects</li> </ul>

# Embedding our Strategy

Our CEO and Board of Directors have ultimate responsibility for sustainability. All members of our Executive Committee participate in our Strategic Review Meeting (SRM), which reviews sustainability strategy and progress at executive level.

Senior representatives from core functions across the business formed the Sustainability Steering Group in July 2012. They meet quarterly to input into the development of policies and long-term strategy.

The steering group is supported by a number of working groups who are responsible for ensuring that the sustainability strategy and objectives are implemented.

The Executive Director's Office and Corporate Sustainability and Compliance team are responsible for embedding sustainability further into the business. Everyone at Jaguar Land Rover is expected to consider sustainability in their everyday work. Sustainability is directly linked to performance objectives and targets through our Corporate Scorecard and Business Plan. A key focus of our sustainability strategy is to inspire behaviour change and create a mindset across the business that ensures sustainability is fully integrated into every aspect of what we do.





“ Sustainability is integral to Jaguar Land Rover’s business plan and we are committed to achieving a sustainable future. ”



# Sustainable Products

Innovating to reduce environmental impacts, including CO<sub>2</sub> emissions, over the product life cycle





# Overview

Our most significant environmental impacts come from our products, but this is also where we can make the most significant improvements. We are working hard to reduce environmental impacts throughout the entire life cycle of our vehicles by focusing on product innovation.

Our future success will be built on developing and delivering products and technologies that meet customer needs now and tomorrow. To do this, we are investing in research, engineering and manufacturing to make more great products, more quickly, and to meet increasing demand while improving fuel efficiency and reducing tailpipe CO<sub>2</sub> emissions.

We have invested more than £2 billion in new vehicles, product creation and development of our facilities in 2012/13 to put us in a strong position to achieve our long-term aspirations.

In addition to our own capabilities, we collaborate with government, academic institutions and leading suppliers to develop new technologies, including new powertrains, hybrid and electric technology, and new materials that will help us deliver world-class sustainable performance. We are on track to meet our 2015 target to reduce our EU fleet average tailpipe CO<sub>2</sub> emissions by 25% against our 2007 baseline.



14MY Range Rover Evoque launched at Frankfurt Motor Show.

# 2012/13 At a glance

Saved 750,000 miles (1.2 million km) of test driving and 290 tonnes of CO<sub>2</sub> during the development of the All-New Range Rover using virtual engineering technologies



22

Committed more than £2 billion to product creation, facility and infrastructure investment



24

Achieved a 22% reduction in our EU fleet average tailpipe reduction in 2012/13 against our 2007 benchmark



27

Range Rover Evoque nine-speed automatic, featuring Stop/Start, offers up to 11% fuel economy improvement compared to the previous model



28

Reduced tailpipe emissions on the 4-cylinder Jaguar XF diesel model to 129g/km



28

Stop/Start technology now available on all our vehicles, except the Land Rover Defender and Jaguar XK



28

Developed the world's first premium diesel SUV hybrid – the Range Rover and Range Rover Sport Hybrids have 26% lower tailpipe CO<sub>2</sub> emissions than the All-New Range Rover



30

Achieved the maximum five star Euro NCAP rating for safety for the All-New Range Rover



36



# Road to 2020: Sustainable Products

Strategy: Reduce environmental impacts across the product life cycle to create innovative low-carbon vehicle solutions for our customers of the future

Objective	2013/14 targets	2020 vision
Innovate to deliver competitive tailpipe CO <sub>2</sub> emissions and fuel economy	<p>Achieve a Jaguar Land Rover EU fleet average of 182g CO<sub>2</sub>/km</p> <p>Comply with US Environmental Protection Agency Greenhouse Gas and China Fleet Stage III fuel consumption</p> <p>Launch first production hybrid for European market</p>	<ul style="list-style-type: none"> <li>All products are ranked amongst leaders for tailpipe CO<sub>2</sub> emissions, fuel economy and cost of ownership</li> <li>Sustainable products meeting the needs of our customers of the future</li> </ul>
Reduce product impacts over the life cycle	<p>Complete Life Cycle Assessment (LCA) studies on Jaguar F-Type and Range Rover to confirm a reduction in environmental impact of more than 10% from previous models</p> <p>Simulate life cycle impacts for all 2017 model year products to enable early sustainability target setting</p> <p>Engage with suppliers to enable more accurate LCA studies and improved environmental performance across the product life cycle</p>	<ul style="list-style-type: none"> <li>Key environmental impacts across the life cycle are 30% lower than the 2007 baseline (where available)</li> <li>Life cycle methodologies and data driven sustainable solutions embedded across our supply chain</li> </ul>
Create sustainable mobility solutions	<p>Develop a 'connected car' strategy and technologies to respond to opportunities for enhanced services and new revenue streams for sustainable mobility</p>	<ul style="list-style-type: none"> <li>Meeting customer mobility needs in the future</li> </ul>
Evaluate new sustainable business models	<p>Identify key systems, materials and processes at risk from resource scarcity and commodity price volatility, and develop a response plan</p>	<ul style="list-style-type: none"> <li>Closed loop processes are implemented for key strategic components and other materials across the life cycle. Recovery of materials for reuse is prioritised and new revenue streams are generated as a result</li> </ul>

# Our Product Strategy

Life Cycle Assessment (LCA) enables us to understand the total environmental impact of a vehicle, identify where our biggest impacts lie and then use this knowledge to inform future research and product development.

## Life cycle thinking

LCAs quantify the environmental impacts of the extraction and use of raw materials, production and manufacturing of a product, use by the customer, and disposal at the end of life. The impact most commonly referred to is global warming potential stated in carbon dioxide equivalent (CO<sub>2</sub>e), combining the different greenhouse gas impacts to enable easier comparison and analysis. The other impacts include other emissions to air, resource depletion and emissions to water.

Integrating life cycle thinking right from the start of our design process encourages our designers and engineers to come up with innovative solutions to key sustainability challenges – from the design of the vehicles themselves to the materials and components we select to make them and the processes and systems used during development. LCA is not a process that delivers quick results. We are committed to seeing through the many years of analysis and refinement of our processes which enable this kind of innovation.

We have the capacity to complete full LCAs for each new vehicle line. We follow the international standards ISO 14040, 14044 and 14062 and we gain third party certification from the Vehicle Certification Agency for full vehicle LCAs.

We have also developed our capabilities to enable us to run two concurrent LCA projects – currently Range Rover Sport and the Jaguar F-Type – for the first time. We have done this by investing in specialist software tools and increasing the skills of our environmental engineers to enable them to carry out the LCA work rather than limiting this to specialist practitioners. This embeds knowledge and understanding within our teams, enabling earlier consideration of life cycle impacts in future vehicle design and material choices. In 2012/13, we fully certified the All-New Range Rover ahead of its launch in August 2012 (see case study, page 22).

We are continuing to develop our Rapid Life Cycle Assessment tool, which enables engineers to assess the environmental impact of various components during the design process. We are including additional impact categories, such as the creation of acid rain, rate of resource depletion and water consumption, to the Rapid LCA tool so that it provides a fuller picture of the overall impacts of each component, and aligns more closely with the full LCA process.





# The Life Cycle

We believe that real progress only comes from learning. That's why we study every stage in the life of a new vehicle to see how we can develop new ways to perform responsibly.

Jaguar Land Rover was one of the first UK vehicle manufacturers to complete an officially recognised study of the overall environmental impact of a vehicle. We call this the Life Cycle Assessment (LCA).

Traditionally, the environmental impact of a vehicle was measured only by its tailpipe emissions. Our LCA process allows us to look at the bigger picture; from the materials and resources used, through a lifetime of customer use, to eventual disposal and recycling.



## Case Study

# Life cycle impacts of the All-New Range Rover

Compared with the outgoing Range Rover model, the All-New Range Rover has achieved some impressive LCA results.

More than 400kg lighter, it features a smaller and more fuel-efficient engine to deliver the same level of performance as the outgoing model, while achieving a 13.8% reduction in its global warming potential over the entire life cycle.

Aluminium production causes higher CO<sub>2</sub> emissions than steel. This means that the All-New Range Rover has a higher CO<sub>2</sub>e output during the production phase, but these emissions are more than offset by improved fuel efficiency during use by customers, delivering the equivalent of 10 tonnes less CO<sub>2</sub> over 200,000km (124,274 miles). Also, we are committed to increasing the amount of recycled aluminium which significantly reduces the CO<sub>2</sub> contribution during production.

The proportion of the overall impact of the vehicle in use is now 63% compared with 70% for the outgoing Range Rover. It also has improved scores across all other LCA categories, except the acidification potential which has increased by 5.8% due to material production of aluminium.

Making the most of our strategic investment in virtual engineering technologies, we also saved 1.2 million km

(750,000 miles) of test driving and 290 tonnes of CO<sub>2</sub> during the development of the All-New Range Rover.

This state-of-the-art technology enables our engineers to deliver more complex new vehicle programmes, such as the hybrid Range Rover and hybrid Range Rover Sport, more quickly. It also helps save costs in product development by reducing the reliance on physical prototypes, and cuts CO<sub>2</sub> emissions by limiting the number of prototypes that need to be driven and tested in the real world.



## LCA impact categories explained

**Global warming potential** – represents the emission of greenhouse gases (e.g. CO<sub>2</sub>, methane and CFC) that contribute to global warming. Predominantly from the vehicle use phase.

-13.8%

**Abiotic resource depletion** – a measure of total depletion (in years) of the proportion of available natural resources (including energy resources) such as iron ore, crude oil, and wind energy. Predominantly from fuel production.

-14.2%

**Acidification potential** – relates to the increase in quantity of acid substances in the lower atmosphere and is a cause of 'acid rain' which contributes to the decline of surface waters, forests and erosion. Predominantly from the materials production phase.

+5.8%

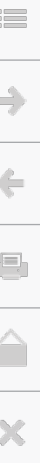
**Eutrophication potential** – the introduction of nutrients in the form of phosphatised and nitrogenous compounds, which can have an accelerated nutrient effect on water courses, creating the proliferation of algae and the associated adverse biological effects.

-3.2%

**Photochemical Ozone Creation potential** – ozone is formed when nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compounds (VOCs) react in the atmosphere in the presence of sunlight. High concentrations of ozone at ground level can have an adverse impact on health.

-3.2%

All-New Range Rover LCA scores as % +/- compared with outgoing Range Rover





# Investing in Research

Investing in research is critical to our sustainability strategy and our overarching business vision. It takes five years to develop new technologies from the research stage to vehicle production, so a key challenge is to anticipate demand and deliver the right technology for our customers at the right time. We monitor global mega trends in society and trends within the automotive industry to ensure that we are able to do this.

We have shown our commitment to producing state-of-the-art vehicles with advanced sustainability performance in technology demonstrator vehicles like the C-X75 (see page 29), and will take forward key elements of the technology showcased for further development and application to future production vehicles. Our life cycle assessment (LCA) and research teams share their knowledge and collaborate closely, so that they can develop advanced research projects that will lead to the success of environmental innovations in the future.





# Research Projects

## Advanced research to create innovations for the future

We are committed to investing in innovative research to find new ways to improve the sustainability performance of our vehicles and reduce the environmental impacts of the design process too.

## National Automotive Innovation Campus (NAIC)

We are investing £50 million in NAIC at Warwick Manufacturing Group (WMG) at the University of Warwick, which is a £100 million project in partnership with Tata Motor European Technical Centre and the UK Government. This state-of-the-art facility will enable us to work with our key partners to develop a wide range of future innovations that will transform the sustainability performance of our vehicles. The centre is scheduled for completion in 2016.

## Virtual engineering

New virtual engineering techniques are revolutionising the way cars are designed and developed. As part of a £10 million five-year collaboration with the Engineering and Physical Sciences Research Council (EPSRC), Loughborough University, University of Leeds, University of Cambridge and Warwick Manufacturing Group (WMG), we are developing the UK's virtual simulation capabilities and gaining access to world-class simulation tools and processes.



# Designing for Fuel Efficiency

Tailpipe emissions can represent up to 85% of the environmental impact of a vehicle over its lifetime.

Powertrain efficiency, lightweighting and developing hybrid and electric technology will enable us to continue to reduce the environmental impact of our vehicles throughout their life cycle, including tailpipe emissions.

Driving innovation in this area is critical, in order to meet customer expectations, comply with and exceed rapidly evolving legislative demands and achieve our ambitious sustainability commitments.

Designing for fuel efficiency includes:

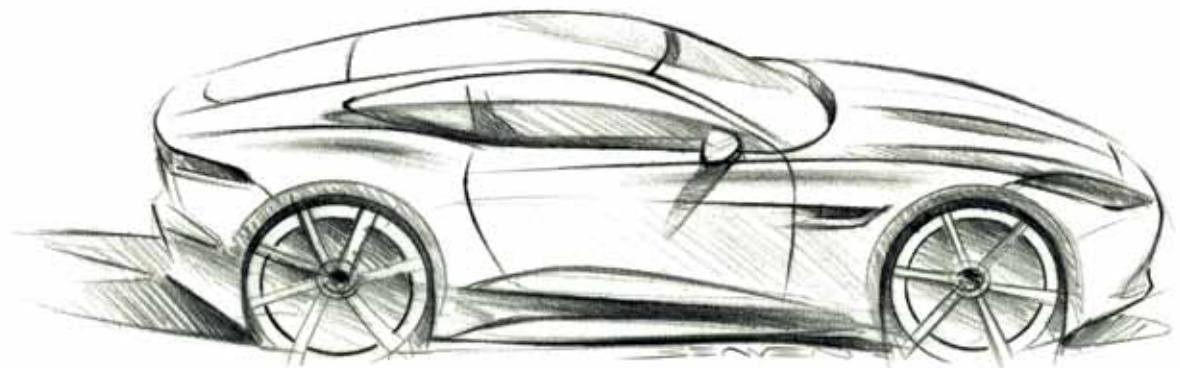
1. Powertrain Efficiency, page 28
2. Hybrid & Electric Technology, page 29
3. Lightweighting, page 32

## Reducing tailpipe emissions

Since 2007 we have been working towards reducing our EU fleet average tailpipe CO<sub>2</sub> emissions by 25% by 2015. In the 2012 calendar year our EU fleet average was 187g/km, which represents a 22% reduction on our 2007 level baseline and means we are on track to meet our target.

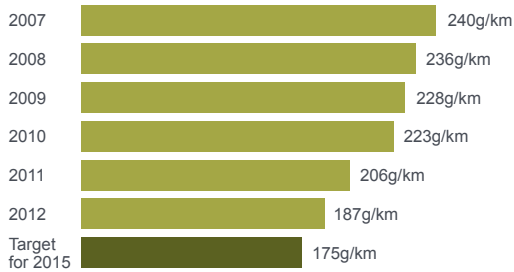
Achieving this 25% reduction target for our EU fleet average will enable us to meet EU regulatory requirements. In other markets there is a similar trend, with long-term tailpipe CO<sub>2</sub> reduction targets set in the US and China, and emerging markets such as Brazil, Mexico and India also developing legislation on emissions and fuel economy.

Keeping up with the pace of change in the global regulatory environment is challenging, particularly because we aim not just to comply with legislation, but to exceed the targets set wherever possible. This evolving context is helping to drive significant innovation and development of technology across the entire sector.



## Jaguar Land Rover EU fleet average tailpipe CO<sub>2</sub> emissions<sup>1</sup>

Total CO<sub>2</sub> emissions (tonnes)



## CO<sub>2</sub> g/km for each vehicle model

CY 2012	Fuel	g/km
<b>Land Rover</b>		
<b>Defender</b>		
2.2L (110/130) Station Wagon	Diesel	295
2.2L (90) Station Wagon	Diesel	269
<b>Freelander</b>		
2.2L TD4 4WD Auto	Diesel	185
2.2L TD4 4WD Manual	Diesel	165
2.2L ED4 2WD Manual	Diesel	158
2.0L Si4 GTDi 4WD Auto	Petrol	224
<b>Discovery 4</b>		
3.0L TDV6 Auto	Diesel	224
3.0L SDV6 Auto	Diesel	230
5.0L V8 Auto	Petrol	328
<b>Range Rover Evoque</b>		
2.2L ED4 2WD Manual	Diesel	133
2.2L TD4 4WD Manual	Diesel	149
2.2L SD4 4WD Manual	Diesel	149
2.2L SD4 4WD Auto	Diesel	174
2.2L Si4 4WD Auto	Petrol	199
Coupe – ED4 2WD Manual	Diesel	129
Coupe – SD4 4WD Auto	Diesel	169
<b>Range Rover Sport</b>		
3.0L TDV6 Auto	Diesel	224
3.0L SDV6 Auto	Diesel	230
5.0L V8 Supercharged Auto	Petrol	348
Data based on EU-27.		

CY 2012	Fuel	g/km
<b>Range Rover</b>		
3.0L TDV6 Auto	Diesel	196
4.4L SDV8 Auto	Diesel	229
5.0L V8 Auto	Petrol	299
5.0L V8 Supercharged Auto	Petrol	322
<b>Jaguar</b>		
<b>XF</b>		
2.2L i4 163PS Auto	Diesel	139
2.2L i4 200PS Auto	Diesel	135
3.0L V6 Auto	Diesel	159
3.0L V6 Supercharged Auto	Petrol	224
3.0L V6 Supercharged Auto AWD	Petrol	229
5.0L V8 Supercharged Auto	Petrol	270
<b>XF Sportbrake</b>		
2.2L i4 163PS Auto	Diesel	135
2.2L i4 200PS Auto	Diesel	139
3.0L V6 Auto	Diesel	163
<b>XJ</b>		
3.0L V6 Auto	Diesel	159
3.0L V6 Supercharged Auto	Petrol	224
3.0L V6 Supercharged Auto AWD	Petrol	234
5.0L V6 Auto	Petrol	254
5.0L V6 Supercharged Auto	Petrol	270
<b>XK</b>		
5.0L V8 Auto	Petrol	264
5.0L V8 Supercharged Auto	Petrol	292

<sup>1</sup>Amount shown are for calendar years

# 1. Powertrain Efficiency

Our vision is to provide enhanced customer experience and performance while making significant improvements in powertrain efficiency. We do this by improving the efficiency of the engine, aerodynamics and transmission, and reducing the friction of tyres on the road. This is a fundamental element of the product development process because it enables us to reduce the tailpipe CO<sub>2</sub> emissions produced by our vehicles.

In 2012/13 we continued to innovate and deliver important achievements through powertrain efficiency such as:

- Reducing the tailpipe emissions of the Jaguar XF diesel model to 129g/km on a 4-cylinder engine. This represents a steep reduction since 2011 when emissions were at 179g/km
- Offering more downsized V6 petrol engines that deliver the same performance as a V8 engine, using less fuel, emitting 14% less CO<sub>2</sub> and, in some markets, running on 85% ethanol which results in even lower tailpipe emissions. In July 2012 the Jaguar XJ was launched with the V6 and the XF followed in September 2012
- Making Stop/Start technology available in every vehicle across all product lines (except the Land Rover Defender and Jaguar XK). By stopping and starting the engine automatically under certain conditions, for

example, when the car is stationary at traffic lights, we can save fuel and reduce CO<sub>2</sub> emissions by up to 7%

- Meeting our target of introducing the new eight-speed automatic gearbox in 30% of vehicles by the end of 2012 and being on track to have implemented eight and nine-speed automatic gearboxes in 80% of vehicles by the end of 2013 (see case study)
- Introducing Active Driveline technology which turns 4WD capabilities off, reconnecting it when needed. Customers still have all the usual 4WD benefits, but with improved fuel economy
- Introducing 'single speed power take off', a weight-saving customisation option on the Range Rover Sport for those who need 4WD performance, but not full off-road and towing capability

Our new Engine Manufacturing Centre in Wolverhampton (see Sustainable Business Operations, page 50) will be the home for a new generation of technologically advanced, lightweight four-cylinder low emission diesel and petrol engines. This will enable us to meet future demand for more vehicles and will support further improvements in fuel economy and tailpipe emissions.

## Case Study

# Range Rover Evoque



In February 2013 we announced the world's first nine-speed automatic in the new Range Rover Evoque. It is one of the most efficient and technically advanced transmissions ever used in a production vehicle.

Compared with the previous model year is six gear ratios, the nine-speed automatic gives an 11.4% improvement in fuel economy, can reduce CO<sub>2</sub> emissions by up to 11% when combined with Stop/Start technology, and delivers enhanced performance and customer experience.

## 2. Hybrid & Electric technology

In addition to improving the efficiency of conventional powertrains, we are also investing in hybrid and electric powertrain technology so that we can reduce tailpipe CO<sub>2</sub> emissions further. We have 260 engineers working on hybrid and electric vehicles – the biggest team of its kind in the UK. Our investment into developing state-of-the-art technologies will enable us to develop high-performing, low-carbon premium products that meet the changing needs of customers around the world.

We are committed to developing innovative hybrid and electric solutions, now and in the future, as illustrated by the C-X75 and Jaguar XJ\_e demonstrator vehicles (see case studies page 29 and 31). We lead a consortium of partners from across industry and academic institutions who are part of the government-backed UK Energy Storage Centre 'catapult', which aims to accelerate the development and commercial delivery of next generation battery technology and alternative mobile energy storage. This work will enable greater advances in electric vehicles across the sector.

### Case Study

## C-X75

The C-X75 hybrid technology demonstrator vehicle was developed in partnership with Williams Advanced Engineering and demonstrates our ability to create highly innovative, technically advanced cars. Its 1.6-litre engine generates 502 brake horse power (bhp) and is matched with 390bhp electric motors that give the C-X75 a 354km/h (220mph) top speed, an all-electric range of 60 kilometres (37 miles) and emissions below 89g/km.

We will take what we have learned from developing the C-X75 and apply it to future production vehicles so that our customers can benefit from this state-of-the-art technology.





## Case Study

# Range Rover Hybrid models

In August 2013 we launched the Range Rover Hybrid and Range Rover Sport Hybrid, the world's first premium diesel SUV hybrids, which will be delivered to customers from early 2014.

The identical hybrid powertrains emit 169g/km CO<sub>2</sub>, 26% lower than the V8 engine vehicle, but with similar performance. The all-aluminium body structures are based on Land Rover's premium lightweight architecture. The hybrid system, including lithium ion battery pack, inverter and electric motor weighs less than 120kg.

The powertrains combine Land Rover's popular 3-litre SDV6 diesel engine with a 35kW electric motor integrated with the 8-speed ZF automatic transmission. The electric motor produces 170 newton metres of torque to boost acceleration, and acts as a generator, harvesting kinetic energy through regenerative braking, charging the battery when the vehicle is slowing. They can travel at speeds of up to 48km/h (30mph) in electric mode for a range of up to 1.6km (one mile) before the diesel engine seamlessly restarts. Both models accelerate to 100km/h (62mph) in under seven seconds, have a top speed of 218km/h (135mph), and deliver equivalent to 44.1mpg on the combined diesel and electric cycle.



## Case Study

# Jaguar XJ\_e wins RAC Future Car Challenge awards

In November 2012 the Jaguar XJ\_e plug-in hybrid electric research vehicle was awarded 'Most Energy Efficient Luxury Car Prototype' and 'Technical Panel's Award of Merit' at the third annual RAC Future Car Challenge. The car combines the lightweight aluminium vehicle structure from the Jaguar XJ with an advanced 2.0-litre hybrid powertrain, a 69kW motor/generator and a 12.3kWh lithium ion battery pack, which can be fully charged by an external 240V domestic supply in around four hours.

With CO<sub>2</sub> emissions of less than 75g/km, fuel economy of 87mpg and the ability to travel 25 miles on electric power, it is also able to reach 100km/h (62mph) in under 6.5 seconds and has a top speed of 250km/h (150mph). The car's intelligent power supply management system automatically switches between petrol power, electric power, or a combination of the two, depending on what is the most efficient mode. It also gave us the opportunity to investigate the use of down sized engines with a PHEV system for achieving further fuel savings in our production vehicles.

The Jaguar XJ\_e was developed through the REEVolution project, which is part funded by the UK Government's Technology Strategy Board and brings together a consortium of leading UK technology companies to develop ultra-low carbon solutions for premium luxury cars.



### 3. Lightweighting

By reducing the weight of a vehicle's body and components we can make our cars more efficient, while delivering the outstanding performance our customers expect. Lightweighting plays an important role in reducing tailpipe emissions and brings significant performance benefits for our customers. We want to continue to lead the industry in building lighter and higher quality vehicles efficiently, so that we can make lightweight vehicles as affordable as possible in future years (see case study, page 33).

#### Investing in aluminium

A major part of our commitment to lightweighting will be delivered by using more aluminium. In 2013 we achieved weight reduction of more than a 400kg in the All-New Range Rover and Range Rover Sport, and 180kg of this reduction was achieved by using a new lightweight aluminium alloy (see RivAlloy, page 34), which we developed with our partner supplier Novelis. The same technology and processes are being applied to the new Jaguar F-Type.

By investing £1.5 billion in our new manufacturing facility in Solihull to introduce advanced aluminium architecture for more of our vehicles, we expect to achieve a significant improvement in fuel economy and reduction in tailpipe CO<sub>2</sub> emissions for our cars in the future. We work closely with the Aluminium Federation and we are part of the strategic advisory team advising the

Engineering Physical Science Research Council on growing UK manufacturing by focusing research on environmental technology.

#### Recycled materials

Using more aluminium brings significant sustainability benefits when vehicles are driven by our customers, but producing primary aluminium uses large amounts of energy and water, and creates waste. Recycled aluminium, however, uses 95% less energy, causes fewer greenhouse gas emissions, reduces water consumption and produces less waste. We are therefore investing in a range of recycling initiatives to develop technology in this area.

#### REALCAR and REALCAR2

We have created a new lightweight modified aluminium alloy that allows for a higher proportion of recycled content.

The alloy is the result of the £2 million Recycled Aluminium Car (REALCAR) research project which we began in 2008. REALCAR, part-funded by the government, aimed to develop and build lightweight automotive body structures using aluminium sheet derived from low-cost, energy-efficient and recycled sources. It allows the scrap aluminium reclaimed from our stamping process to be segregated and recycled

through a closed loop system and re-melted into the same grade quality sheet.



Recycling materials in this way reduces the amount of new aluminium we need to buy, making it much more cost-effective, as well as maintaining high performance and contributing to our sustainability objectives. In February 2013, we launched REALCAR2, a two-year, £1 million project to explore the business case and technology for including an additional 25% of recycled post-consumer, non-automotive scrap, like drink cans, in a new grade of aluminium alloy. The challenge is to develop an alloy that can absorb the wider range of chemical variations that come with post-consumer recycled materials, and still provide the high performance required for use in car body structures.

We are collaborating closely with the Technology Strategy Board, the University of Warwick, Innoval Technology and aluminium suppliers Novelis and Aleris on REALCAR2.

## Case Study

# Lightweight Technology

Today's car industry is as high-tech as aerospace. We are at the centre of the UK automotive industry's drive to deliver technical innovation in all areas of vehicle development. One of the ways we are demonstrating our commitment to innovation and sustainability is through our investment in lightweighting.

A number of Jaguar and Land Rover vehicles are now made using revolutionary all-aluminium bodies that significantly reduce each car's weight. This not only enables better fuel economy, but also improves performance, handling and comfort.

Investing in further development of innovative lightweight aluminium architectures remains a key focus for Jaguar Land Rover. In September 2013, we announced an investment of nearly £1.5 billion to introduce a technically-advanced aluminium vehicle architecture that will form the basis for a new range of future Jaguar and Land Rover models.

This high-strength, lightweight vehicle architecture will enable even greater fuel efficiency. The first new model to feature this will be a new sports sedan from Jaguar.

We believe using aluminium will enable us to make significant advances in the sustainability performance of our vehicles. But the production of aluminium uses a lot of water and energy, and we are committed to technology developments, such as REALCAR (see page 32) that will enable further use of recycled aluminium to reduce these impacts, and REALCAR2 which is researching innovative solutions for higher recycling rates.





## RivAlloy

With partners in our supply chain, we have developed a new aluminium casting alloy called RivAlloy that maintains the same level of performance but tolerates higher levels of impurities and helps to reduce the amount of aluminium sent to landfill. Technical development is nearly complete and we are planning to start using this alloy on vehicles from 2014. We will source RivAlloy from a UK supplier and this will also reduce CO<sub>2</sub> emissions from inbound transport.

## Materials and design exchange (MaDE)

We are partnering with MaDE (a collaborative network of designers and materials scientists) to engage design and engineering students in exploring the disassembly process and the potential for re-using and recycling components and materials at the end of a vehicle's life. This is a strategic research project, funded by the Technology Strategy Board, through which we will learn more about the opportunities for the automotive industry to maximise the value in vehicles and reduce the environmental impacts of shredding.



# Using more sustainable materials

By using life cycle assessment up front in the design process we can understand what material choices are most sustainable over the lifetime of the vehicle for delivering the premium look and feel that our customers expect. We work with suppliers to understand their processes and where improvements can and have been made to reduce emissions in production. This specific supplier information can then be fed directly into our life cycle tools, enabling engineers to make informed decisions with the latest and most accurate data available.

## Renewable and natural materials

We aim to select materials such as leather, natural rubber, wood, cardboard and cotton from sustainable sources such as sustainably managed forests or reusing waste cotton from garment factories. We are also researching new types of natural fibres that could reduce the weight and life cycle impact of vehicle components compared to plastic. Biotext is made from flax natural fibre woven into a strong fabric and once heated and formed, could be used to make semi-structural components such as door trim panels.

The Jaguar F-Type floor board uses Eco Technilin which has a recycled cardboard core and flax/natural sugar binder outer layers.

The natural sugar binder used is a by-product from food industry production waste. Using these natural materials makes it lighter, while maintaining the required strength and rigidity.





# Product safety

Safety is important to our customers and we take our responsibility to meet their expectations and needs very seriously. Safety is a priority in the design of our vehicles and we consistently achieve safety targets that go significantly beyond the minimum legal requirements.

Our Vehicle Safety Integration managers ensure that safety is considered at every stage of a vehicle's design and development. In addition to rigorous safety testing, we also increasingly evaluate how intuitive and user-friendly new safety features are. By anticipating customer interaction and responses, we can significantly enhance their effectiveness.

## Safety features

Active and passive safety systems are built in to all our vehicles. Active safety systems help to prevent accidents using features such as forward facing and reversing cameras that can detect imminent impact, automatic cruise control and blind spot monitoring. Passive safety systems include seatbelts, airbags and other mechanisms that reduce the impact of a crash.

We have pioneered a lane departure warning system that offers two sensitivity options. Whereas other similar systems can be intrusive, warning drivers even when they intentionally leave their lane, our improved technology enables them to choose a more sophisticated option which only gives a warning if the driver does not appear to be alert. Enhancing the usability of this feature reduces the chance of customers switching the system off, increasing the likelihood that it will be able to prevent an accident. We are implementing this technology across Land Rover vehicles in 2013 and plan to extend it to Jaguar vehicles in the future.

## Safety testing

All vehicles undergo rigorous scrutiny and assessment, both from our own safety teams and external testing such as Euro NCAP, the independent assessor of car safety in Europe. Our vehicles continue to score highly even as Euro NCAP tests become more demanding.

In 2012 the All-New Range Rover was awarded five stars by Euro NCAP, and achieved one of the highest ever scores for pedestrian protection in the "Large Off-Roader" vehicle category. Its side impact restraints system provides optimum protection for passengers of all sizes in a range of impact scenarios, and it received maximum points for protection of an 18-month old infant. The bumper also scored maximum points for protecting pedestrians' legs.

We work closely with Euro NCAP and Thatcham – The Motor Insurance Repair Research Centre – to develop effective test protocols and methodology for testing specific systems such as autonomous emergency braking.

# Helping customers make more sustainable choices

Giving customers the best possible driving experience and ownership is at the heart of everything we do. Our research tells us that two-thirds of prospective customers in Europe consider corporate social responsibility to be a key part of the appeal of a premium brand, and three quarters of them now consider the development of sustainable automotive technologies to be an urgent priority for our industry.

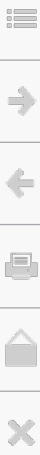
We are investing in research, engineering and manufacturing processes to ensure that our cars become more fuel efficient and reduce their CO<sub>2</sub> emissions without compromising on customer experience. To maximise the impact of the technology we implement in our vehicles, we engage our customers to help them understand what they can do to improve the sustainability performance of their car.

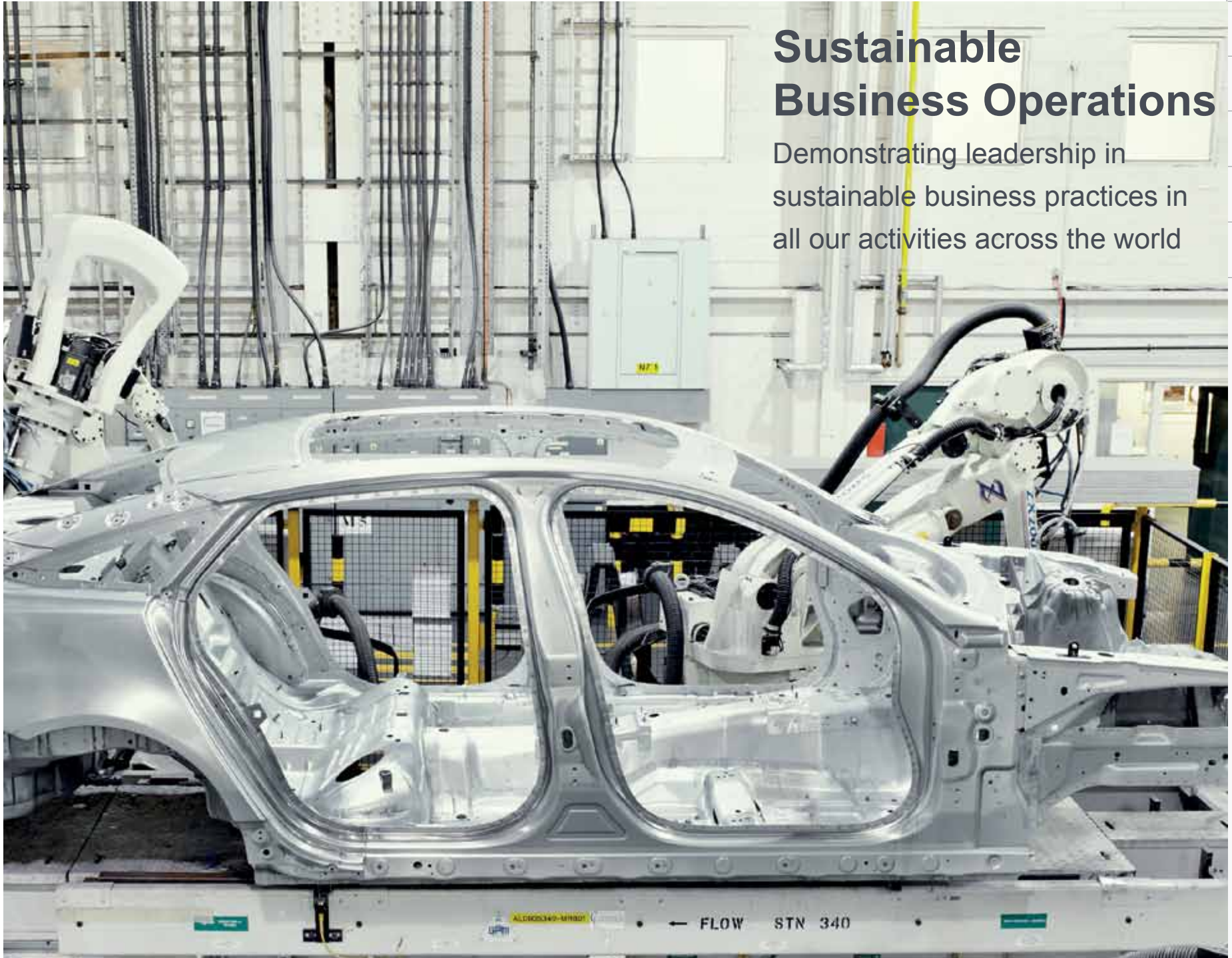
For example, when we introduced Stop/Start technology in the majority of our vehicle lines, we worked with our dealers to ensure that customers had the right guidance and information to help them make the most of this new technology and understand its benefits.

The new World Light Duty Test Procedure – a method of calculating fuel economy – aims to ensure that customers are provided with more accurate information on typical fuel economy in real-world driving conditions, enabling them to make better informed decisions when purchasing a car. We are fully engaged with the industry working group European Automobile Manufacturers' Association (ACEA), and work closely with the EU Commission in this area.

## Take Back

We want to ensure that more of our vehicles are disposed of responsibly, and that the materials and components that can be re-used or recycled are salvaged. Our dealerships in the Europe Union advise customers on how to dispose of their cars through our free take back programme. In the UK there are 250 take back points, all of which are operated by a supplier, Cartakeback, and licensed by the Environment Agency as authorised treatment facilities. You can find a list of authorised facilities at [www.cartakeback.com](http://www.cartakeback.com)





# Sustainable Business Operations

Demonstrating leadership in sustainable business practices in all our activities across the world



# Overview

While we continue to research and develop new technologies to reduce tailpipe CO<sub>2</sub> emissions from the use of our vehicles (which is our biggest environmental impact), managing the impacts of our own business operations is also essential.

The manufacture of a new vehicle - including sourcing raw materials and making components - accounts for a significant portion of its life cycle impact. We are working to reduce this impact by improving energy efficiency, increasing use of renewable energy, and reducing water use and solvent use. Cutting waste is a priority, and we are increasingly focusing on treating waste as a resource by seeking innovative ways to reuse or recycle it.

We are also working with our suppliers to source materials and components more sustainably, as well as streamlining our logistics operations to reduce impacts from transporting components to our factories and finished vehicles to our customers.

We have made significant progress over the past five years and our sustainability strategy sets out clear targets to 2020 to continue improving our performance in all these areas.





# 2012/13

## At a glance

Reduced CO<sub>2</sub> emissions from manufacturing by just under 7% per vehicle produced compared with 2011/12; absolute levels rose by 12% due to business growth



43

Achieved BREEAM Excellent rating for our new data centre



44

Cut waste to landfill by 61% per vehicle produced compared with 2011/12



48

Cut water use by 5% per vehicle compared to 2011/12; total consumption increased by 14% compared with 2011/12



49

Sourced 48% of materials used to construct our new Engine Manufacturing Centre in Wolverhampton within a 50km radius of the site



50

Reduced our total CO<sub>2</sub> emissions from transport by 18% per vehicle since 2008



54



# Road to 2020: Sustainable Business Operations

**Strategy: Demonstrate leadership in sustainable business throughout our operations and our supply chain**

Objective	2013/14 targets	2020 vision
Deliver sustainable infrastructure and operations	All new-build and refurbishment projects globally comply with our sustainable building requirements; and meet minimum performance standards set out by organisations such as BREEAM, LEED and SKA Rating	<ul style="list-style-type: none"> <li>Jaguar Land Rover facilities showcase ultra-low carbon technology and sustainability principles</li> </ul>
Reduce our emissions of greenhouse gases	<p>Reduce CO<sub>2</sub> emissions from our UK manufacturing to 0.84 tonnes per vehicle produced</p> <p>Develop a long-term energy strategy to include financing, energy procurement, low carbon technologies, renewables and off-setting</p>	<ul style="list-style-type: none"> <li>Operational CO<sub>2</sub> emissions/vehicle produced are 30% lower than the 2007 baseline</li> <li>Jaguar Land Rover operations are carbon neutral (through renewable energy and offsetting)</li> </ul>
Build resilience to both legislative and physical climate change impacts	Review climate change risks across our facilities and develop a mitigation and adaptation plan	<ul style="list-style-type: none"> <li>All Jaguar Land Rover sites and strategic supply chain facilities are resilient to climate change impacts</li> </ul>
Evaluate water impacts across our operations and improve water efficiency	Reduce water use in manufacturing to 3.12 m3 per vehicle produced	<ul style="list-style-type: none"> <li>Water use per vehicle produced is 30% lower than the 2007 baseline</li> </ul>
Eliminate waste and improve resource efficiency	<p>Reduce waste to landfill from manufacturing operations to 4.77 kg per vehicle produced</p> <p>Achieve zero waste to landfill at product development facilities</p>	<ul style="list-style-type: none"> <li>Zero waste across our operations</li> <li>Waste is viewed as a resource and there is zero waste across our operations.</li> </ul>
Partner with our suppliers to deliver sustainable procurement practices around the world.	<p>Define sustainability attributes for future sourcing decisions to drive improved performance, and establish means to measure and collect data on environmental impacts in the supply chain</p> <p>Launch Achilles Automotive supply chain mapping methodology to identify supply chain sustainability risks and opportunities (see page 51)</p>	<ul style="list-style-type: none"> <li>Sustainability criteria are applied in all sourcing decisions</li> <li>Achilles Automotive Supply Chain Mapping is established as comprehensive supply risk evaluation and mitigation model</li> </ul>
Reduce the environmental impacts of our logistics	Reduce CO <sub>2</sub> emissions from inbound and outbound logistics to 0.39 tonnes per vehicle	<ul style="list-style-type: none"> <li>While growing globally CO<sub>2</sub> emissions per vehicle from inbound and outbound logistics are maintained at 0.39 tonnes</li> </ul>

# Managing environmental impacts

We have manufacturing sites in Solihull, Halewood and Castle Bromwich, and product development and research facilities at Gaydon and Whitley - all in the UK.

Minimising environmental impacts is especially important as we look to expand manufacturing capacity with our new Engine Manufacturing Centre in Wolverhampton (see case study, page 50) and internationally through our joint venture in China. In 2012/13, we developed a set of global sustainability standards as a framework for all our manufacturing sites around the world, including during construction.

We concentrate on cutting greenhouse gas emissions while reducing the use of energy, solvents, water and other natural resources, which helps reduce our costs. We set targets in these areas and we quantify the environmental impact of our raw material use, production and manufacturing through life cycle assessments.

Our compliance with environmental regulations is verified through various mechanisms, including internal and third-party audits and a comprehensive compliance assurance process. All sites are certified to the ISO 14001 environmental management certification system. In 2012/13 we did not receive any fines or prosecutions related to breaches of environmental regulations.



# Targeting emissions reductions

CO<sub>2</sub> emissions per vehicle from manufacturing operations continued to fall, dropping by nearly 7% to 0.86 tonnes in 2012/13. However, absolute emissions increased by 12% to 334,180 tonnes year-on-year, as a result of a 20% rise in production volumes.

Owing to major changes taking place at our plants, where we are preparing for future model lines, we saw an increase in energy consumption and related emissions. As a result we have not met our ambitious 25% five-year reduction target for CO<sub>2</sub> emissions per vehicle produced, but we did achieve a 21% reduction in emissions per vehicle from the 2007 baseline.

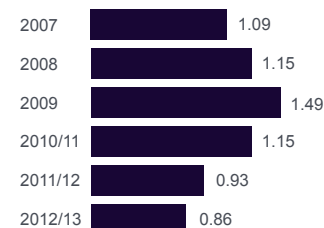
When our Environmental Innovation target was set in 2009, global business conditions were poor and we did not anticipate such significant business growth. We produced almost 100,000 more vehicles in 2012/13 than we did in the baseline year of 2007 – and we have expanded or improved several manufacturing plants to support further innovation in our products. At Solihull, for example, we embarked on a £370 million investment in all-aluminium production facilities to support lightweighting in our vehicles. This construction work will deliver significant emissions reductions over time and contribute to more sustainable products (see page 32), but in the short term it has increased CO<sub>2</sub> emissions at the plant. From January 2010 to March 2013, we invested £8.5 million in infrastructure projects to reduce

CO<sub>2</sub> emissions at our facilities, such as pipework insulation, rationalising boilers, low-energy lighting, paint shop oven refurbishment, and metering of photovoltaic roof installations. This investment is producing average carbon savings of 27,536 tonnes a year.

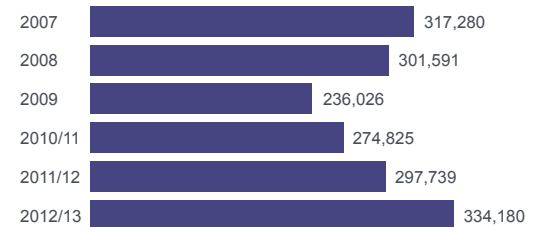
In 2013, we will invest a further £2 million on similar projects, including an energy-efficient car wash and upgrades to our combined heat and power plant distribution. Together, these measures will reduce carbon emissions by a further 5,600 tonnes per year and help us achieve our new target to become carbon neutral by 2020.

Total emissions at our non-manufacturing sites increased by 16% to 43,660 tonnes in 2012/13 as a result of a rise in the number of employees on site, increased overtime and shift working, and more vehicle testing.

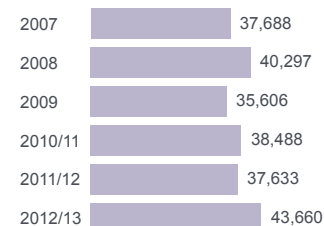
Total manufacturing CO<sub>2</sub> emissions per vehicle (tonnes per vehicle)



Total manufacturing CO<sub>2</sub> emissions (tonnes)



Total non-manufacturing CO<sub>2</sub> emissions (tonnes)

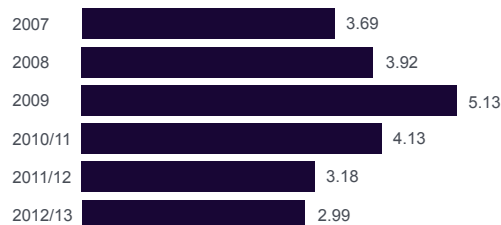


# Energy efficiency

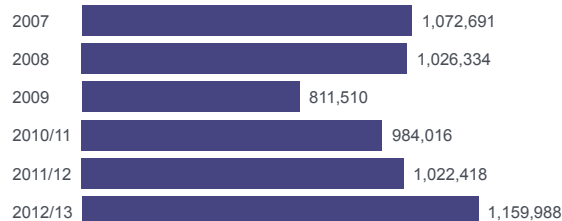
The construction of new, more efficient buildings and refurbishment of existing ones, as well as changes to manufacturing systems and equipment, cut energy consumption for manufacturing by nearly 6% per vehicle produced in 2012/13. We have now cut energy use per vehicle by more than 18% over the past five years.

However, because of increased production volumes, total energy use at manufacturing sites rose by 13% in 2012/13 to 1.16 GWh. This demonstrates the extent of the task we face to further cut energy use, which is the biggest source of CO<sub>2</sub> emissions in our manufacturing. We have begun to develop a long-term energy efficiency strategy to address this issue. The strategy will be reviewed by the Sustainability Steering Group in 2013/14.

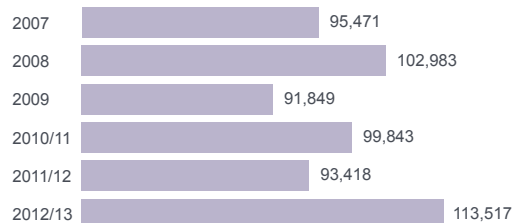
Total manufacturing energy used per vehicle (MWh per vehicle)



Total manufacturing energy use (MWh)



Total non-manufacturing energy use (MWh)



## Case Study

# Energy efficient data

In 2012/13, Jaguar Land Rover became the first company outside the data management sector to begin using a new type of energy efficient modular data centre.

The data centre has a predicted power usage effectiveness (PUE) ratio of 1.21, compared with the industry standard of 1.8. This means more of the power used by the data centre is delivered to computing equipment, rather than used for cooling and other peripheral demands.

The purpose-built facility in Solihull has achieved BREEAM\* Excellent status for design and post-construction stages. It includes photovoltaic cells on the roof and thermal efficiency systems in the attached offices, and cooling for the data centre is provided by natural ventilation for most of the year.

\*BREEAM, the world's leading design and assessment method for Sustainable Buildings.

## Renewable and alternative energy

Using low-carbon or renewable energy reduces our reliance on fossil fuels, helping us to improve energy security and cut CO<sub>2</sub> emissions. Combined with energy-efficiency measures, this can help us to reduce absolute CO<sub>2</sub> emissions even as production volumes continue to rise.

In 2012/13, we installed photovoltaic panels at our new visitor centre in Solihull, which opened in December 2012. The panels will generate enough power to ensure the centre is virtually self-sufficient and will save 25 tonnes of CO<sub>2</sub> emissions a year.

We are introducing solar wall heating systems (known as transpired solar collectors) at our new Engine Manufacturing Centre in Wolverhampton. These systems use cladding placed in front of exterior walls to heat the air between the cladding and the walls. The air is then ducted through a ventilation system to heat the interior of the building.



We are also assessing the feasibility of using alternative energy sources such as biofuels, including the possibility of supplying one of our manufacturing sites with electricity and heat from an advanced combustion technology plant that would burn waste wood from the UK and could supply 90% of the site's electricity needs. In addition, we are reviewing a number of heat recovery technologies, including testing the use of heat from exhaust stacks to generate electricity at product development sites.

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

We work hard to reduce CO<sub>2</sub> emissions from the manufacture of our vehicles, but some emissions are inevitable. CO<sub>2</sub> offsetting enables us to reduce our impact now by balancing the emissions that have not been eliminated. We offset 100% of our manufacturing assembly emissions.

Our offsetting programme supports the growth of renewable energy, clean technology, and energy efficiency projects through various schemes around the world (see Global Corporate Social Responsibility, page 85).

We recognise that while offsetting has a place in a wider carbon strategy, it must always be carried out in conjunction with activities that reduce direct and indirect emissions. Offsetting complements our carbon reduction strategy, and does not replace it.



“ We achieved a 54% reduction in total waste sent to landfill compared to 2011/12. ”



# Using resources efficiently

## Waste

Waste generated by our manufacturing operations increased by 19% in 2012/13 to 18,270 tonnes from the previous year, as a result of increased production and substantial construction work. However, we achieved a slight drop in waste per vehicle and 75% less waste was sent to landfill per vehicle produced - significantly exceeding our 25% Environmental Innovation reduction target by the end of March 2013 based on 2007 levels.

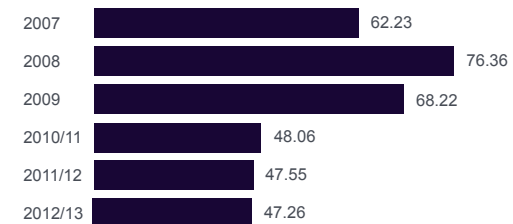
We achieved a 54% reduction in total waste sent to landfill by using recycling facilities that accept mixed waste, introducing more accurate measurement of waste, and raising awareness among employees to improve waste segregation.

By promoting innovative uses of waste, we encourage employees to see waste as a valuable resource. For example, due to a change in the company's corporate legal identity, we had large amounts of letter-headed stationery that could no longer be used in 2012/13. Instead of simply sending the paper for recycling, we re-processed it into notepads with covers made from another waste stream – rubber from our Solihull plant.

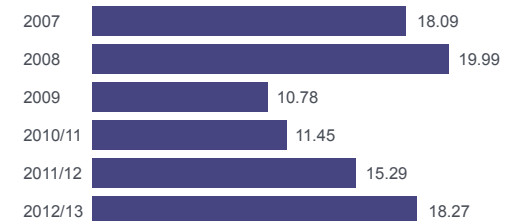
During construction of our visitor centre in Solihull we worked with contractors to recover and recycle 24 tonnes of nylon powder and 25 tonnes of waste polyurethane dust. Along with other 'green' measures, this helped us achieve the building's 'very good' BREEAM rating.

Our new vision for 2020 will target zero waste. In 2012/13, we set up a working group to define what zero waste means for Jaguar Land Rover and consider how to encourage the use of waste as a resource to help us achieve our goal. We are also continuing our work with the Warwick Manufacturing Group (see page 25) to investigate how to achieve zero waste. This involves identifying all waste streams and possible routes for treatment, reuse and recycling, as well as establishing feasibility studies at various sites.

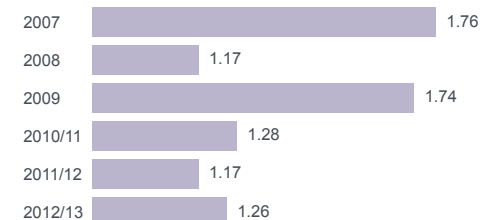
Total manufacturing waste per vehicle (kg/ vehicle)



Total manufacturing hazardous and non-hazardous waste generated (thousand tonnes)

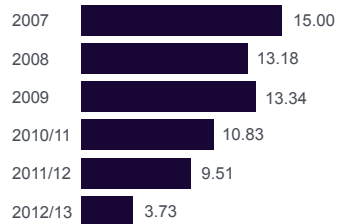


Total non-manufacturing hazardous and non-hazardous waste generated (thousand tonnes)

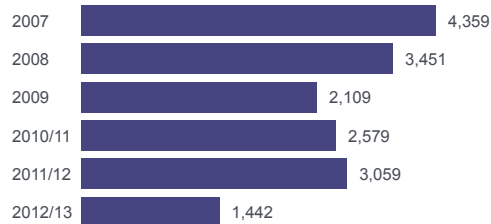


## Waste

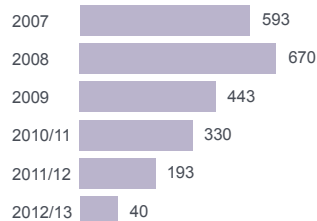
Total manufacturing waste sent to landfill per vehicle (kg/vehicle)



Total manufacturing waste sent landfill (tonnes)



Total non-manufacturing waste sent to landfill (tonnes)



## Case Study

# Every Can Counts

We have been encouraging staff to recycle their drink cans through the nationwide Every Can Counts initiative for over three years. This nationwide scheme promotes aluminium and steel drink can recycling in the workplace by helping businesses to engage employees and set up recycling facilities. The programme is now established at our Whitley, Gaydon and Heritage Motor Centre sites, and has most recently been introduced at our Castle Bromwich manufacturing site and Education Business Partnership Centres.

In 2013, we extended Every Can Counts to the UK Dealer Network (257 locations). Each site has received its own starter pack of materials and details on how to be a part of the initiative. In the future we plan to roll this out to all our sites to ensure it is fully integrated into our recycling and waste management culture. In addition, we are encouraging suppliers to adopt the initiative to amplify its impact across the UK.

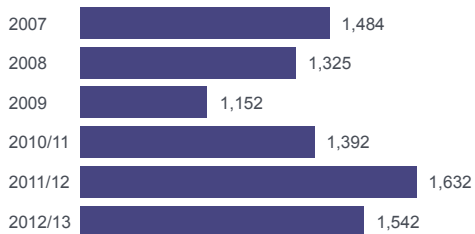


## Solvents

Emissions of volatile organic compounds from solvents used in our paint shops can contribute to local air pollution. We are committed to minimising our use of solvents by switching to water-based, low-solvent coatings to reduce emissions without compromising paint quality. 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 European Solvent Emissions Directive.

Solvent use in the 2012 calendar year fell to 1,542 tonnes despite increased production volumes, and 40% of this was reclaimed for reuse.

Total solvents used in manufacturing processes (tonnes) (calendar year)

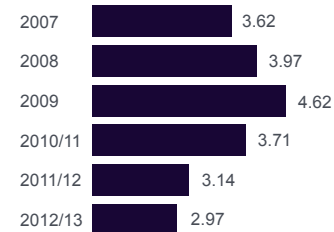


## Water

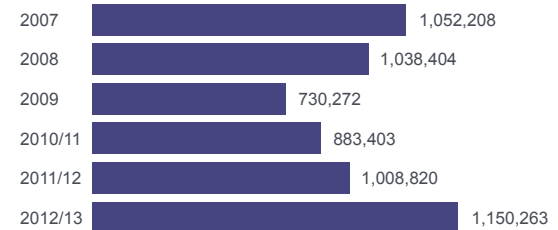
We reduced water use per vehicle produced at our manufacturing sites by 5% in 2012/13, although our total water use in manufacturing increased by 14% to 1.15 million cubic metres due to higher production volumes. We exceeded our Environmental Innovation target of reducing water use per vehicle by 10% by March 2013 from a 2007 baseline – achieving a reduction of 17% over the period. Our paint shops remain a key focus for water reduction efforts, as this is where much of our water use occurs.

We recognise that water use will become a bigger issue for us as we begin manufacturing outside the UK. Our new water focus group, made up of representatives from across the business, is identifying further opportunities to reduce our water consumption. Resources have been allocated for water efficiency projects and the group is responsible for implementing and evaluating those with the greatest potential impact.

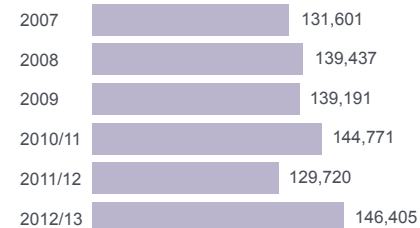
Total manufacturing water used per vehicle (m<sup>3</sup> per vehicle)



Total water use (m<sup>3</sup>)



Total non-manufacturing water use (m<sup>3</sup>)



## Case Study

# Sustainability at Wolverhampton

Our new Engine Manufacturing Centre in Wolverhampton – expected to be operational by the end of 2014 – is on target to achieve our goal of an ‘excellent’ rating from the BREEAM assessment for sustainable buildings.

This green building minimises energy demand through the use of insulated cladding, maximises daylight through its roof design (saving on electric lighting), and creates natural ventilation with automated louvres (saving on cooling).

We include sustainability criteria in the sourcing of all equipment used in the building, and construction materials have been locally sourced wherever possible, with 48% purchased within a 50km radius. Indoor lighting will automatically adjust according to the amount of daylight available and turn off when areas are not in use. External lights will use optically controlled, high-efficiency LED lighting throughout, minimising light pollution. A fully integrated building management system will monitor energy use. Harvested rainwater is stored underground for use in the plant.

Extensive landscaping and green space enhances the feel of the 80 acre (32 hectare) site, which has a ‘green corridor’ allowing wildlife to cross undisturbed. We plan to help employees become involved in biodiversity enhancement and other green activities near the building.

A green travel plan is being developed for the site, and we have been working with transport providers and local authorities to establish bus and cycle routes.





# Sourcing more sustainably

The environmental impact of our operations is not confined to our own facilities. In fact, the impacts in our supply chain are greater. We spent £9.9 billion buying raw materials and components from 710 supplier sites in 2012/13. Our sustainability strategy emphasises the importance of sustainable sourcing in meeting our environmental and social goals.

## Setting high standards for suppliers

We expect suppliers to uphold the same high standards of sustainability as we set ourselves, and work closely with them to reduce the environmental and social impacts of the products we buy. We also work with other automotive sector companies with which we share a common supplier base, to maximise our influence.

We clearly communicate our expectations to suppliers, monitor their compliance, and support them in meeting these expectations by developing strategic, long-term relationships and offering training and guidance.

Our social and environmental requirements are set out in our Global Terms and Conditions and our Supplier Guide on Sustainability, which includes a Code of Basic Working Conditions. We regularly review our sustainability requirements for suppliers, updating them in March 2013 with new guidance on conflict minerals. We also expect suppliers to convey our requirements to their own suppliers.

## Collaborating with industry peers

In April 2013, we jointly announced the establishment of the European Automotive Working Group on Supply Chain Sustainability, with eight other major European vehicle manufacturers. The Working Group will develop common sustainability standards for the automotive supply chain, and enable us to share experiences with peers, work together on common supply chain projects, and send joint messages to suppliers about our sustainability activities and requirements.

Since 2011, we have been working with Achilles, the supply chain management service, to develop a web-based system for the automotive industry that will allow participating companies to share sustainability information about their suppliers. One of our first actions with the European Automotive Working Group on Supply Chain Sustainability was to agree a common supplier questionnaire for the automotive industry, which will now be used as part of the Achilles automotive supplier management system.

In addition, we have helped Achilles create a supply chain mapping module for the automotive industry, which will help companies better understand where key sustainability risks lie in their supply chain, particularly in terms of second-tier suppliers and below.

## Case Study

# Tackling conflict minerals

Focus on conflict minerals has heightened as a result of new US regulation, which from May 2014 will require large companies to file reports on whether any of their products use tantalum, tin, gold or tungsten that comes from the Democratic Republic of the Congo (DRC) and surrounding countries. The regulation also requires companies to demonstrate that these minerals are sourced from conflict-free certified smelters. The European Union is also taking steps to adopt similar regulation.

In March 2013, we published a policy on compliance with this legislation, demonstrating our commitment to sourcing minerals in a manner that respects human rights. We do not directly source any of the minerals cited in the regulation, but we have more than 50,000 components where tantalum, tin, gold or tungsten are used. We have told suppliers they must comply with our policy and report on the use of such minerals via the Achilles automotive supplier management system. This will be enhanced from 2014 to include a supply chain mapping facility to help suppliers meet these reporting requirements.

## Case Study

# Incentivising suppliers on sustainability



In 2013, we conducted a pilot programme designed to help suppliers earn a higher price for their components by working in partnership with us to improve their sustainability performance.

We identified key criteria that affect the CO<sub>2</sub> efficiency of components and challenged suppliers to improve performance in exchange for a better price.

This means that a supplier can earn more for their component by, for example, committing to and delivering a better than minimum friction target for mechanical moving parts – something that would cut tailpipe emissions of our vehicles.

The end result is that suppliers which design parts that outperform their competitors through greater CO<sub>2</sub> efficiency are rewarded through increased business and better pricing.

## Working with suppliers to reduce environmental impacts

In 2012/13, we drew up short, medium and long-term objectives for our purchasing department that explicitly focus on supply chain sustainability and will mean suppliers' environmental performance will be integral to all sourcing decisions by 2020.

We also established an international unit within our purchasing department to make sure that potential suppliers in growth markets meet our sustainability standards. In addition, we introduced global standards to guide construction projects as we begin to expand our manufacturing output internationally, notably in China.

New production suppliers are assessed against our Jaguar Land Rover Quality standard, which requires all long-term strategic suppliers to achieve third-party accreditation to the international environmental management standard ISO 14001 before they can qualify as a Jaguar Land Rover supplier. We worked closely with potential suppliers in 2012/13 to help them achieve this and the proportion certified to ISO 14001 increased from 70% to more than 75%. We aim to increase this to 80% in 2013/14.

We rigorously apply standards on restricted substance management in compliance with the European Union's regulation on the registration, evaluation, authorisation and use of restricted chemicals (known as REACH). We maintain a comprehensive list of prohibited or restricted substances that production suppliers must not use, and require our suppliers to report any substances of concern. If these are present, then they must be engineered out of any components supplied to manufacture our vehicles.

One of the key ways we engage with suppliers on environmental performance is through the Carbon Disclosure Project's Supply Chain Initiative, which encourages suppliers to measure, report and set reduction targets on their climate impacts. As part of the initiative, in 2012/13 we invited 118 strategic suppliers to report on their carbon strategies, management and performance. Of these, 76% responded, up from a 46% response rate in 2011/12. Increased reporting and disclosure will help us understand suppliers' sustainability impacts and support improved performance.

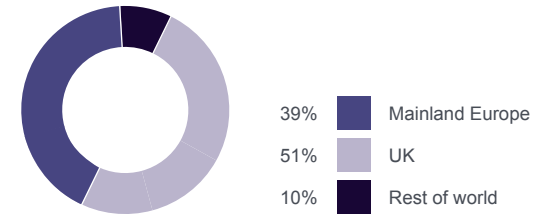
## Supporting local suppliers

Our aim is to have strong local supply chains so that we can source components from suppliers close to our manufacturing sites where possible. This helps to improve responsiveness, saves fuel, reduces CO<sub>2</sub> emissions and supports local economies.

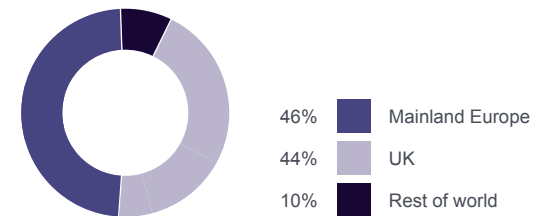
However, it is still necessary to source some components from further away, and our procurement team balances the need to source high quality and affordable components from emerging markets with the costs and environmental implications of longer transport distances. As we establish manufacturing sites in growth markets such as China, we will aim to source at least 40% of components locally. In 2012/13, we continued to support the UK economy through our procurement practices, increasing the proportion of our supplier spend in the UK from 44% to 51%.



Location of production suppliers by spend 2012/13



Location of production suppliers by spend 2011/12



# Reducing transport impacts overview

We use logistics partners to bring components and materials from suppliers to our factories (inbound logistics), and to transport finished vehicles to dealerships for sale to customers (outbound logistics).

Transport accounts for 45% of our operational carbon footprint. In 2012/13, components travelled 60 million miles to our manufacturing plants, and our products travelled around 54 million miles to customers in 178 countries. Around 80% of the vehicles we manufacture in the UK are sold abroad.

Using transport more efficiently reduces environmental impacts and cuts costs. Almost all our transport is run by third-party logistics service providers and working closely with them is central to improving efficiency.

We exceeded our Environmental Innovation target to cut CO<sub>2</sub> emissions from logistics transport by 15% per vehicle delivered from a 2008 baseline by the end of March 2013, achieving an 18% reduction.

## Transporting components to our factories

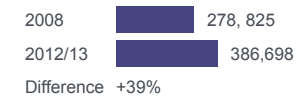
Increasing production volumes in 2012/13 presented a challenge for inbound logistics, as we needed to source more components to manufacture more vehicles. This means it is even more important to focus on improving efficiency.

In 2012/13, our lead logistics provider updated its entire UK freight fleet of 190 trucks used for Jaguar Land Rover supplier collections, replacing them with new vehicles that meet the European Union's most recent Euro5 engine specifications, a move which is expected to cut emissions by 580 tonnes of CO<sub>2</sub> per year. These vehicles also have built-in telematics that allow monitoring of driver behaviour so that we can target training to help drivers use less fuel. This helped to save nearly 500 tonnes of CO<sub>2</sub> in 2012/13.

We have moved warehousing of our engines closer to our Castle Bromwich and Solihull manufacturing sites in order to reduce delivery distances, and in North America we began to ship some components in the same sea freight containers we use to supply spare parts for customers to reduce the number of containers required.



Total car volume





## Transporting vehicles to our customers

One of the biggest challenges we face in reducing environmental impacts of outbound logistics is that our customer base is growing in emerging markets as we sell more products in countries such as China and Russia. This means the distances our products travel are greater, making it difficult to reduce overall emissions from outbound journeys.

Our efforts to improve efficiency meant that emissions from outbound logistics remained steady at 0.23 tonnes per vehicle in 2012/13, despite higher volumes being exported to markets outside the UK, particularly China.

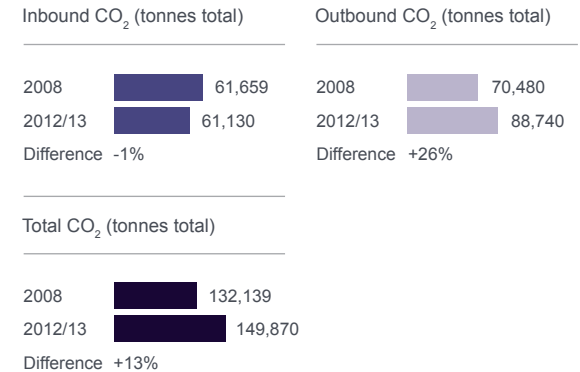
For example, greater use of rail reduces emissions by about 30% over road, and in 2012/13 we increased the number of rail services we use for delivery from 15 to 17 per week to keep up with growing production volumes. In 2012/13, the volume of finished vehicles shipped by rail from our Halewood plant to UK ports of exit increased by 144%. By working with our service provider to redesign rail wagons, we have increased the number of vehicles per day transported via rail by 27, bringing the total average per service to 104 vehicles and reducing our emissions by 235 tonnes per year. In the medium term, plans to manufacture some vehicles closer to growth markets such as China will help us further reduce outbound emissions.



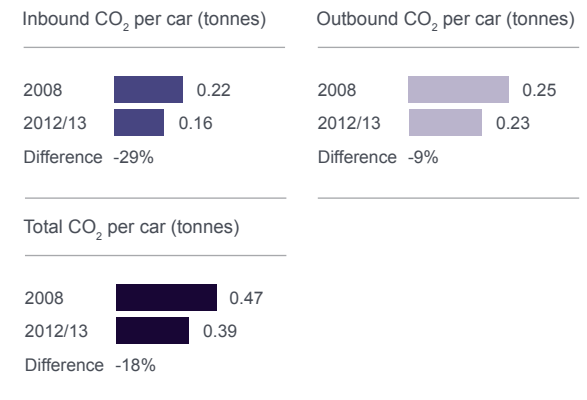
We have begun discussions with other vehicle manufacturers to make better use of truck movements so that, for instance, transporters delivering our vehicles to ports of exit from the UK can pick up other company's vehicles arriving from overseas to avoid empty return journeys. After reaching a contractual agreement with one of our providers, BritEuropean, in 2014 we will become the first UK finished premium vehicle manufacturer to use dual-fuel (diesel/LPG) trucks to transport vehicles.

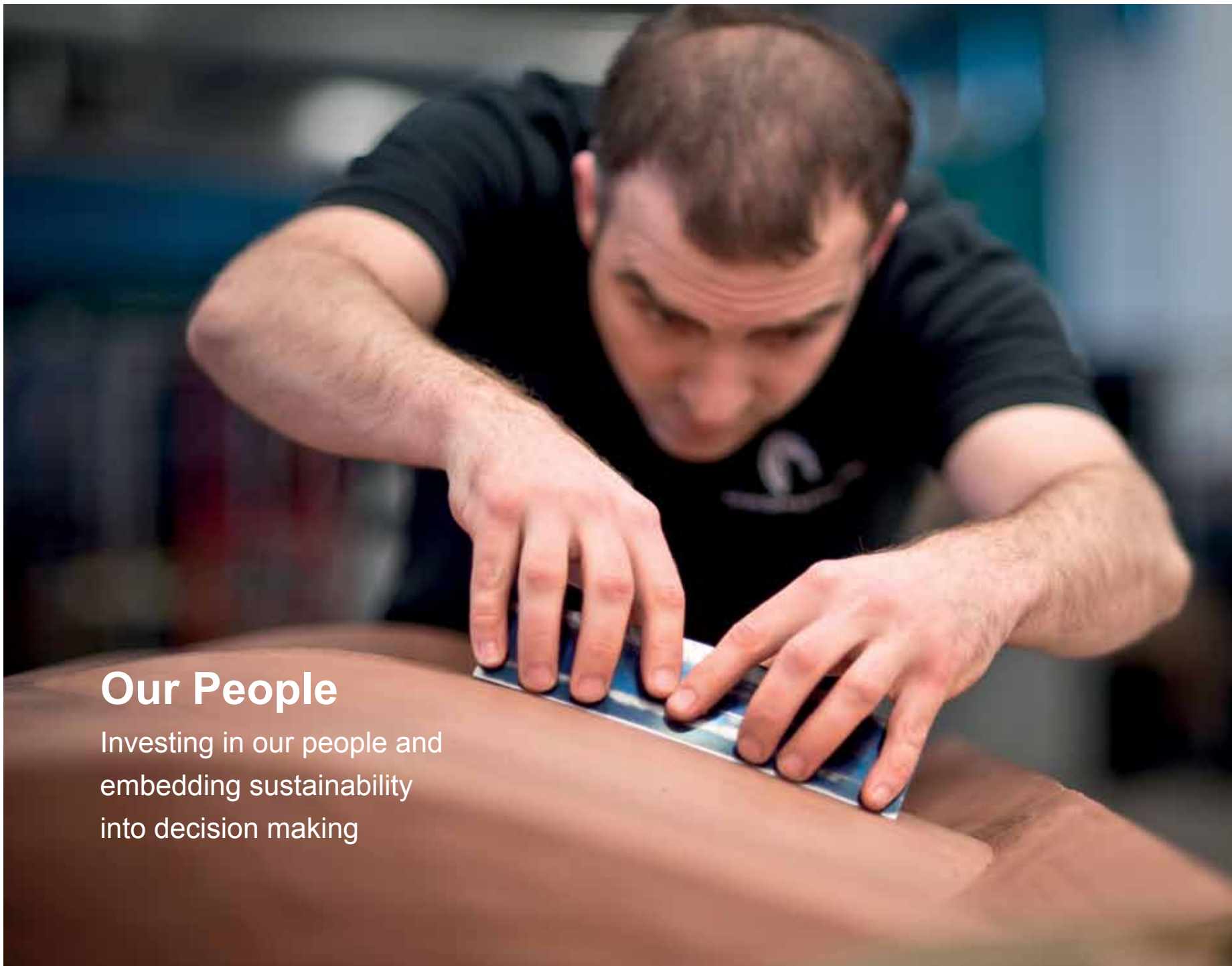
We have introduced a sustainability clause into all future UK distribution contracts with transport service providers that commits them to achieving targeted reductions in CO<sub>2</sub> emissions over the contracted period. The tendering process also includes an environmental questionnaire, and all service providers will receive a ranking on sustainability criteria before selection. In this way we aim to improve the sustainability performance of service providers, delivering benefits for us and them.

## Emissions from logistics – Total



## Emissions from logistics – per car





# Our People

Investing in our people and embedding sustainability into decision making

# Overview

Our business is growing, and with it our workforce. Over the past four years the number of people we employ has increased by 71% from 14,605 to 24,913 in 2012/13.

We need a global team of talented, motivated and engaged employees with the right skill sets to build our business and meet the needs of customers now and in the future. Providing exciting development opportunities, training, fair reward, and an inclusive, safe and healthy working environment helps us attract and retain the best people.

Our workforce is made up of salaried staff (43%) and hourly paid production employees (57%). We aim to meet the needs of both groups by listening and responding to feedback gained through our employee engagement survey (Pulse, see page 62) and by maintaining good relations with trade unions.

We encourage our people to give their best, help them get the most out of working with us and make sure they are well informed about our business progress and strategy. Their support is essential to help us meet our business and sustainability objectives.



Jaguar Land Rover welcoming its largest single intake of graduates.

# 2012/13

## At a glance

Employee Engagement Index improved to 74% for production employees and 81% for salaried staff, compared with a UK benchmark of 64%

50 engineering degree places now offered to apprentices

15% reduction in lost time case rate per 200,000 hours worked

62



£20.1 million invested in training and development

65



189 apprentices recruited

71



Five-year zero harm plan in development

65



51,682 days training provided to employees

65



Women in senior management increased from 5% to 7%

71



New wellness kiosks encourage employees to improve their health

65



68



75

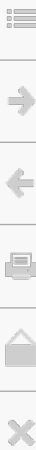




# Road to 2020: Our People

Strategy: Invest in our people and create sustainability change

Objective	2013/14 targets	2020 vision
Embed sustainability into business planning processes	<p>Develop sustainability impact and environmental accounting assessment methodologies</p> <p>Embed sustainability action plans into all departmental objectives</p>	<ul style="list-style-type: none"> <li>All business decisions consistently deliver more sustainable outcomes</li> </ul>
Engage employees and recognise sustainable business behaviours	<p>Undertake sustainability skills assessments and deliver training on sustainability</p> <p>Track employee engagement with our sustainability programme through our annual employee survey, and benchmark performance externally to identify areas for improvement</p>	<ul style="list-style-type: none"> <li>Jaguar Land Rover leads industry benchmarks for positive employee opinion of the company's contribution to sustainable development</li> </ul>
Develop our people and value diversity	<p>Develop targets and implement programmes to align employee skill sets with the right jobs, enabling global mobility of personnel</p>	<ul style="list-style-type: none"> <li>Jaguar Land Rover is recognised internally and externally for the value obtained from its progressive diversity policies</li> </ul>



## Case Study

# Engaging new employees from the start of their career at Jaguar Land Rover

In 2012/13, we introduced a new programme for making employees feel part of the business from their first day at Jaguar Land Rover. Research shows that such programmes can improve employee retention by 25%<sup>1</sup> and employee performance by as much as 11.3%<sup>2</sup>.

We now ask line managers to arrange a telephone chat with new starters before they join the company, and then allocate them a 'buddy' to show them around when they arrive. We have refreshed our corporate induction so that new recruits receive a full morning of welcome and guidance, which covers the practical elements of starting a new job, and introduces our culture and values. They then receive another full-day session to familiarise them with our strategy and introduce our executive team.

Regular feedback meetings and surveys in the first 18 months enable us to check in with new employees to make sure they are settling in and have the resources they need.



<sup>1</sup> LaShawn, Thompson 'On-boarding: Maximizing Productivity and Retention', PM Boulevard June 2007

<sup>2</sup> Corporate Executive Board Recruiting Roundtable Survey 2005

# Changing mindsets:

## Engaging our people on sustainability

We need our employees to understand why sustainability is important and to provide the innovation and skills to help us achieve the ambitious objectives set out in our sustainability strategy. Without their support, we cannot make progress towards our environmental and social goals. Many of our people are already highly engaged and enthusiastic about our sustainability objectives, and much has been achieved so far.

But we cannot take that enthusiasm for granted. That's why we are putting sustainability at the centre of our People strategy. Training is a crucial part of this, to raise awareness of sustainability and make sure our people understand how they can help us address specific issues. We have already begun to map out a set of skills we believe our employees need to support our new sustainability targets for 2020. We plan to focus our training approach on enhancing these skills from 2014.

In 2013 we launched the Jaguar Land Rover Innovista programme, which recognises employees' commitment to innovation across all areas of the business, including sustainability. Culminating in a prestigious annual ceremony in January 2014, we will celebrate the most innovative projects and ideas presented by employees, and the best of these will go forward to the group-wide Tata Innovista Awards.

## Ethical conduct

Integrity is one of the five key values that underpin our sustainability strategy and our business. We expect employees to comply with our ethical Code of Conduct at all times. Each year we ask every member of our salaried staff to certify that he or she has read, understood and will comply with the Code. Employees must promptly report any actions they believe may violate the Code, and there will be no reprisals against those who file reports in good faith, even if they are not certain a violation has occurred.

Concerns can be reported directly to managers; to the compliance or human resources departments; via our intranet; or through a confidential telephone and web-based helpline run by a third party. We investigate all reports and anyone found in breach of the Code may be subject to disciplinary action, including dismissal in the most serious cases. In 2012/13, a total of 63 whistleblowing reports were received, and disciplinary action was taken where appropriate.

Ethical training on topics such as bribery is mandatory for all salaried staff, as well as some employees working with us for agencies, contractors and suppliers.



# Engaging employees

We communicate with employees through our intranet site, plant newsletters, a company magazine, webcasts, 'town hall' meetings and regular meetings with managers. We engage regularly with employees about company strategy, talk to them about changes to the business that may affect them, and seek feedback on our performance as an employer.

One of the main tools we use to gauge their views is our Pulse employee engagement survey, which is open to all employees to complete in work time. More than 7,100 salaried staff and over 10,600 production employees took part in the 2012/13 Pulse survey. The overall response rate remained high at 82% (compared with 83% in 2011/12), with the key measures showing an improvement on our scores the previous year and against UK benchmarks.

Our Employee Engagement Index - which measures how engaged employees are based on questions about pride in the company, satisfaction, advocacy and commitment – showed 74% of production employees and 81% of salaried staff viewed the company favourably (compared with 72% and 79% respectively in 2011/12). This is well above the external UK benchmark of 64%.

Responses to Pulse allow managers to discuss the factors affecting engagement levels with their teams, help to identify actions and targets for improvement, and guide the development of company policies and practices. We now have more than 50 Pulse 'Champions' who receive training on how to interpret data from Pulse, facilitate action planning in their business units, discuss implications of the results with staff and seek their feedback on priority areas for action.

We also use a Performance Excellence Index (PEI), based on Pulse results, to measure the extent to which employees are committed to high levels of customer service and product quality. This showed, among other things, that 82% of production employees understand our performance standards for quality and service (up from 79% in the previous index) and that 70% of salaried staff regularly use customer feedback to improve work processes (up from 67% in the previous survey).

## Selected Pulse responses

	Salaried staff		Production employees	
	2011/12	2012/13	2011/12	2012/13
Employee Engagement Index	79%	81%	72%	74%
Would recommend Jaguar Land Rover as a good place to work	81%	83%	74%	77%
Feel Jaguar Land Rover supports employees' efforts to balance work and family/personal responsibilities	55%	62%	40%	42%
My manager treats me with dignity and respect	87%	88%	66%	69%
My manager/supervisor provides me with recognition or praise for doing good work	73%	76%	51%	50%
Satisfied with the actions Jaguar Land Rover is taking to be socially responsible	78%	80%	63%	63%

## Case Study

# Team Talk Online

Many of our employees do not have regular access to the internet on the job, especially those working on our production lines. We recognise that this can make it more difficult for them to keep up to date with developments in the business, so in 2012/13 we launched Team Talk Online, a website designed for employees to use at home or wherever they access the internet. Once registered, employees can access the site at any time to keep abreast of business updates and to access information on benefits, training and development opportunities.

Over 2,000 employees have accessed the site to date, and we are exploring options to increase the opportunities for production employees to access more online content more easily.

**FOR JAGUAR LAND ROVER PEOPLE**

# teamtalk

**LAND-ROVER**

**World's finest luxury SUV is taken to new heights**

## All-New Range Rover revealed

**XF and XJ get All-Wheel Drive**

**What's new? Taking a look at XJ and XF Coupé**

**Plant preparations**

**Pride of Place**

No. 17 SEPTEMBER 2012



## Consulting with trade unions

In 2012/13, 81.6% of production employees and 44.8% of salaried staff belonged to one of our recognised trade unions.

We are committed to consulting unions on changes to the business and regularly negotiate with them on pay, terms and conditions for our employees. We generally agree a two-year pay deal with the unions. Proposed deals go to a workplace ballot and are implemented if the majority agrees. The most recent two-year agreement for Jaguar Land Rover production employees and salaried staff came into effect on 1st November 2012.

We also have an Information and Consultation Forum, where employees from across the business are elected as representatives to meet with Jaguar Land Rover management on a regular basis to receive business updates and discuss matters of common interest.

In view of significant growth in the business, we have increased the frequency of our national-level meetings with union representatives, which were previously held quarterly and now take place around every six weeks. More frequent discussions enable union officials to stay better informed of developments in the business and raise any potential concerns promptly.

Our grievance procedure follows 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.



# Developing our people

Demand for training has increased as our workforce has grown, and as we continue to develop new products and expand our business in different markets. We offer a range of training and development opportunities to build skills and nurture talent to support the needs of the business and individual employees, helping us to retain and develop our most talented people.

	2010/11	2011/12	2012/13
Apprentices taken on	36	114	189
Graduates joining Graduate Development Programme	135	337	312
Undergraduate industrial placements (3-15 months)	49	66	97

## Training

In 2012/13, we invested £20.1 million in training and development. We provided 51,682 days of training on health and safety, management and leadership, and technical, business and personal skills. This was a 22% increase compared with 2011/12.

Also in 2012/13, we created an online Academy that acts as a one-stop-shop for employees to access training. The Academy enables people to blend traditional learning in a classroom with the use of virtual resources, including online training and mobile phone apps. Following a pilot in our finance department, the Academy will now be developed for other functions. We also extended the number of courses offered through our Personal Skills Programme, which offers training on subjects such as time management and how to influence people.

As we increasingly move into global markets and manufacturing, we are developing new training programmes for overseas employees, as well as translating existing courses into local languages. During 2013/14, we will review all our training to make sure it responds appropriately to employees' needs as our business grows. To do this, we will use a new evaluation framework for measuring return on investment for training courses.

## Onboarding and nurturing young talent

The continued increase in recruitment made induction training for new employees a key focus in 2012/13. The number of such programmes completed in 2012/13 rose to more than 4,000, compared with around 1,500 the previous year. We introduced a new onboarding process to make sure people are engaged in the business from their first day on the job, or even before (see case study, page 60).

We also increased our focus on nurturing young talent (see Global Corporate Social Responsibility, page 82). We hired 189 apprentices (up from 114 in 2011/12) and launched a Higher Apprenticeship Programme that offered 50 of these apprentices the chance to study for an Applied Engineering degree with the University of Warwick (see page 67). We recruited 312 graduates and arranged 97 undergraduate placements.

We now have more than 600 people on graduate programmes and Jaguar Land Rover was ranked 21st in The Times Top 100 Graduate Employers in 2013, up from 26th the previous year. Our Graduate Development Programme has been updated for 2012 and now encompasses more skills that promote employability, as well as hands-on business and manufacturing-focused visits and placements.

## Case Study

# Generation Talent

We are working with Manpower on Generation Talent – a new Business in the Community (BITC) programme which launches in November 2013. It aims to engage 90 of the UK's top employers to work with BITC, Job Centre Plus and the Department for Work and Pensions to tackle youth unemployment and highlight the opportunities available for unemployed people aged 16-24.

Manpower and Jaguar Land Rover are part of the Early Adopters steering group which includes Asda, BBC, Costain, City & Guilds, Direct Line, ISS, National Grid and Morgan Sindall. The group is developing self-assessment tools for companies, helping them to grade their recruitment practices and identify how they can increase the number of applications from, and appointments to, young people. The group is also building a portfolio of best practice and advice on how to improve engagement with young, unemployed people, regardless of the size of the company.



## Developing our leaders

We place great importance on leadership training, and we have delivered leadership programmes to nearly 2,500 people since 2010. In 2012/13, we created a 'leadership journey' framework accompanied by a coaching and mentoring strategy that will improve the quality of leadership training.

In partnership with an external training provider, we held a four-day leadership event in Warwickshire and London for our top 500 global leaders. This emphasised cultural changes in the business and the shift towards a more global approach, a 'customer first' mentality, greater consideration of environmental sustainability, and emphasis on cost optimisation.



## Supporting further education

We support employees wanting to obtain degrees or professional qualifications relevant to their work through part-time courses. We offer 60 degree places for employees each year, including 55 for apprentices. Our longstanding partner, Warwick University, continues to deliver the Applied Engineering Programme (AEP), a part-time degree course that enhances employees' skills in key engineering competencies. Warwick is also helping us provide modular training for our team in India. In the future, these modules will be taught by local education partners and will also be available in China. For engineers working in the automotive supply chain and other hi-tech industries, we offer a pioneering higher education programme, the Technical Accreditation Scheme (TAS), and the Advanced Skills Accreditation Scheme (ASAS), a modular Masters degree (see Global Corporate Social Responsibility, page 82).

## Performance management and career planning

Our aim is for every staff member to have an annual appraisal to measure performance against personal objectives and corporate behaviours, and to discuss career plans. In 2012/13, 96% of employees received an appraisal, up from 94% in 2011/12.

We have changed the way we evaluate salaried staff, with a focus on fewer and more strategic objectives for each individual. We now place a greater emphasis on providing quality feedback halfway through the year, which helps to improve performance and facilitates a conversation about individual development and career plans.

	2010/11	2011/12	2012/13
<b>% of employees completing an appraisal</b>	95	94	96
<b>Number of days training</b>	21,851	42,425	51,682

# Valuing diversity

Employing people with a wider range of experiences and backgrounds helps us better understand the needs and aspirations of our customers, making Jaguar Land Rover more responsive to market demands.

## Promoting equal opportunities

We are committed to treating our employees with respect - regardless of age, disability, gender, gender reassignment, race, religion or belief, or sexual orientation – and to promoting equal opportunities in the workplace and recruitment process.

Employees are encouraged to challenge and report discrimination and must comply with our Dignity at Work policy. This is designed to prevent harassment, bullying and victimisation, and is part of induction training for new starters. Diversity Councils across the company, made up of employees from all levels, oversee the policy and organise local actions and events. We support employees with disabilities through occupational health departments and accessibility measures at all sites. In 2012, we were awarded the Two Ticks symbol by the UK Government's Jobcentre Plus organisation, which recognises employers that have made commitments to employ, keep and develop disabled staff.

In 2012/13, diversity in the total workforce remained steady. Women made up 9% of our workforce and 8% of employees came from ethnic minorities (defined as non white British/Irish/Other). The proportion of women in senior management positions rose from 5% to 7% in 2012/13.

	2010/11	2011/12	2012/13
<b>Women</b>			
% women in workforce	8	9	9
% women in management (approx top 1,800 employees)	12	12	13
% women in senior management (approx top 125 employees)	5	5	7
<b>Ethnic minorities</b>			
% ethnic minorities in workforce	8	8	8
% ethnic minorities in management (approx top 1,800 employees)	5	6	5
% ethnic minorities in senior management (approx top 125 employees)	1	3	2



## Focusing on gender balance

Improving gender balance is an ongoing challenge, as the engineering base of the automotive industry has traditionally attracted more men than women. This area remains a priority to help us widen our talent pool.

We are working hard to promote careers in engineering to young women through, for example, imaginative recruitment activities to reach more female undergraduates at university careers fairs and our new Young Women in the Know programme (see case study, page 70).

Jaguar Land Rover and WISE, an organisation dedicated to increasing the proportion of UK women working in the fields of science, technology, engineering and maths, will provide a £9,000 bursary to three female students or apprentices who want to explore a career, or further studies, in engineering. The winners will also receive mentoring support from senior engineers at Jaguar Land Rover.

Our Engineering Network for Women organises networking events to connect women who work for Jaguar Land Rover with female engineering students, while the Jaguar Land Rover's Women in Engineering Sponsorship Scheme, launched in 2011, gives support to female undergraduates interested in engineering careers, as well as work placements of up to 15 months with the company. Each participant is assigned a mentor and given a bursary of £1,500.

In 2012/13, there was an increase in the proportion of new female apprentices to 7%, up from 5% in 2011/12. The proportion of women who took up undergraduate placements in 2012/13 also increased from 18% to 24%. Among graduate recruits, this number remained the same as 2011/12, at 18%.

As well as attracting more women to join Jaguar Land Rover, we also want to help them move up to management and offer a personal development programme specifically for women to help them achieve this. Our increased focus on flexible working will also enable employees to balance work and family commitments more easily (see page 75).



## Case Study

# Young Women in the Know

In 2012, we created the Young Women in the Know course in partnership with Birmingham Metropolitan College to encourage more young women into engineering and manufacturing careers. We have now held two successful pilot courses for young women in the Midlands who are interested in STEM careers, and rolled them out nationally in August 2013. During the week-long programme, the young women, aged 15-18, visited Jaguar Land Rover's manufacturing, design and engineering sites, met female employees from apprentices to senior managers and did a day's work experience. The students also took part in workshops to improve their employability skills.

90% of pilot participants agreed that the clean and modern world of engineering and manufacturing was nothing like they expected, and their interest in engineering and design careers at Jaguar Land Rover increased by 35%. By the end of 2013, 200 young women will have participated in Young Women in the Know activities and we plan to introduce another programme for female primary school students in 2014.



# Ensuring a safe working environment

The safety of our people is one of our key priorities. We have continued to strengthen our safety management and improve performance.

In 2012/13, we began consulting with external experts and advisors to develop a five-year Destination Zero plan to eliminate all incidents of harm, whether lost time accidents, health effects, or minor injuries. We have already begun promoting a zero harm culture by holding sessions with senior leaders at our sites, as well as functional leaders and Executive Committee board members.

## Managing health and safety

Everyone at Jaguar Land Rover must comply with our Health and Safety Policy, which outlines the measures we take to reduce risks. Managers are responsible for implementation of the policy, and all employees are expected to keep safety considerations uppermost in their minds. All our sites are certified to the international health and safety certification standard OHSAS 18001. In 2012/13, we strengthened our Safety Behaviour Index, which site supervisors complete during each shift to record performance against safety criteria. Supervisors are now required to provide a written commentary identifying and describing hazards, and stating how these have been addressed.

Manufacturing employees receive weekly health and safety briefings, a quarterly bulletin, and safety briefs in response to any significant incidents that occur. Contractors are vetted on safety management and policies before they are allowed on site, and have to prepare a document stating how they are planning to monitor health and safety. Once on site, we regularly audit their performance and advise them on any unsafe practices we observe.

## Safety performance

Our safety performance has continued to improve. In 2012/13 we achieved a 15% reduction in the lost time case rate per 200,000 hours worked, achieving our target for year-on-year improvement. The most common types of injury were cuts and lacerations.

We reported 40 serious incidents under the Reporting of Injury Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR), down from 47 in 2011. We investigate all incidents to assess their causes and implement remedial measures.

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. Jaguar Land Rover was not subject to any prosecutions by the HSE in 2012/13, but continued to cooperate fully with an ongoing HSE investigation into the death of one of our employees in 2011 at our press shop in Halewood.

We have made groundbreaking safety improvements to our press shop facilities, including the installation of CCTV on overhead cranes so supervisors can watch operations remotely and make sure no-one is in danger. We have also introduced a more accessible online accident reporting system that reduces paperwork, provides consistency across the company, and makes it easier to report incidents, first aid treatment administered, and near misses. It also allows us to more easily produce safety reports and conduct analysis for Jaguar Land Rover as a whole, for specific sites, or even for individual buildings, which has proved a useful tool for comparing performance.

	2010/11	2011/12	2012/13
Number of reportable incidents (under RIDDOR)	60	47	40
Lost time case rate (number of lost time cases per 200,000 hours worked)	0.22	0.2	0.17

# Putting safety at the heart of business expansion

As our business grows, we are building new facilities and modifying existing ones to enable us to develop new products and pursue our sustainability objectives.

In 2012/13, we set up a training programme for employees at manufacturing plants on health and safety related to the production of hybrid electric vehicles. For example, because the batteries used in these vehicles are much higher voltage than conventional batteries, they must be fitted by trained personnel to ensure safe handling. This is supported by a Safe Systems of Work manual for operators, and we have introduced a colour-coding system for hybrid electric vehicles so that associated electrical hazards are visible to operators and anyone visiting the plant. We have also produced a hybrid electric vehicle awareness video.

Construction work at new and existing sites is primarily carried out by contractors and can be high risk. We are determined to work with contractors to try to eliminate any risks. All construction contractors must have their risk assessments and method statements approved before starting a job. We help small contractors write risk assessments and give them advice on managing risks. We have also set up control documents that record details of all permitted contractors on sites. These can be audited at any point.

Although construction of our advanced Engine Manufacturing Centre in Wolverhampton (see page 50) is not yet complete, we have appointed a safety manager to ensure standards are high from the outset. The management team at Wolverhampton has been briefed by leading safety experts, and we have already established health and safety targets for the plant and set up a safety culture programme. We are working with our equipment suppliers to help them develop manufacturing equipment that will reduce risks when the facility becomes operational.

We are also working with our partners in China to ensure our joint venture there will meet UK health and safety standards. Members of our occupational health and safety team have visited China on a number of occasions to discuss health and safety management systems that should be implemented when it becomes operational.

## Case Study

# Extending the safety culture



Traditionally, our health and safety efforts have primarily targeted higher risk areas such as our manufacturing production lines and vehicle workshops. Now we are increasing our focus on other functions of the business, such as HR, Purchasing, Quality and Engineering. During 2012/13, our health and safety experts met the directors of each function to ensure they understand their obligations in this area. Each director has nominated a 'Safety Champion', and functional health and safety committees are being created to oversee initiatives such as risk assessments of computer screens and equipment, office layout and driving hazards.

By raising awareness of health and safety among office-based employees, hazard spotting and near miss reporting have already increased in office environments.





“ £20.1 million  
invested in training  
and development  
in 2013. ”





## Promoting health and wellbeing

We encourage employees to live a healthy lifestyle and balance their work and family commitments. This is good for our employees and benefits the business by reducing absence rates and improving productivity. In 2012/13, we achieved a 39% reduction in our occupational absence rate to 1.6 days lost per 200,000 hours worked.

Health promotion activities take place at all Jaguar Land Rover locations, supported by on-site occupational health facilities. In 2012/13, we introduced Well Point Kiosks – self-service machines that allow employees to measure their blood pressure, body mass index, body fat percentage, and ten-year risk of heart disease. This encourages them to improve their health by eating well, reducing stress and taking more exercise. By the middle of 2013, 6,366 people had registered to use the Kiosks, and 14,400 tests had been taken. We also opened Wellbeing Centres at our Castle Bromwich and Halewood plants during 2012/13.

Flexible working options that contribute to employee wellbeing include job-sharing, part-time work, working from home, and variable hours where an individual's role allows. We have a competitive maternity leave package of one year at full pay. Employees can also request a career break of up to four years if they have been with the company for two or more years.

The percentage of salaried staff who feel Jaguar Land Rover supports efforts to balance work and family/ personal responsibilities increased 7 points to 62% in the 2012/13 Pulse survey, while the percentage of production employees who feel the same rose by 2 points to 42%. Despite the improvements, we recognise that this remains an area for improvement and we are exploring ways to improve work-life balance in future.

For example, we have also begun piloting 'smarter working' initiatives which aim to make lasting improvements to working practices by changing management culture, IT and property management, and employment policies. As well as enabling better work-life balance for employees, we believe these changes will deliver a more productive and sustainable working environment and lower costs by enabling office workers to work more flexibly. Results of the pilots will be analysed at the end of 2013.

	2010/11	2011/12	2012/13
Occupational absence rate (number of days lost per 200,000 hours worked)	2.79	2.64	1.60
First-time visits to occupational health centres	663	716	701







## Global Corporate Social Responsibility

Advancing the knowledge of young people through education partnerships, and improving the lives of millions of people through our community and CSR programmes

# Overview

By 2020 we aim to have a positive impact for 12 million people worldwide through our global corporate social responsibility (CSR) programme.

We will advance knowledge and skills by nurturing talent in our workforce and providing 2 million young people with inspiring learning experiences in science, engineering and technology. This will give us access to a pool of talented people with the skills required to meet the needs of our customers now and in the future.

Our global CSR programme will also create opportunities for 10 million vulnerable people to make a positive change in their lives. We are achieving this by working with external partners and engaging our network of National Sales Companies across our markets to deliver projects that protect the environment, improve humanitarian and health issues, and promote education and talent development.

By focusing on the outcomes of our efforts we aim to ensure we deliver maximum benefits for communities around the world.



Building Hope School & classrooms in China with China Youth Development Foundation.

# 2012/13

## At a glance

### Advancing Knowledge

BITC 2013 Education Award achieved for 'Inspiring Tomorrow's Engineers' – more than 2 million young people have participated in the programme over the past decade



80

Jaguar's Maths in Motion competition is the UK's largest school mathematics challenge with 200,000 entries in the 2011/12 academic year



81

Groundbreaking new modular Master's degree launched: the Advanced Skills Accreditation Scheme



82

### Improving Lives

Improved 2 million lives and offset 10 million tonnes of CO<sub>2</sub> since 2007 through our CO<sub>2</sub> offsetting programme, for example by providing efficient stoves and water purification units, which bring health benefits and reduce emissions



85

Supported 49 renewable energy projects through our global CSR programme, generating 7.4 million MWh of clean energy - enough to power London for 49 days



85

More than £1.7m donated to local charities in cash and in kind



88

More than 17,000 hours dedicated to volunteering in the community by Jaguar Land Rover employees



89





# Road to 2020: Global CSR

Strategy: Develop skills and nurture talent to build a sustainable future, and improve the lives of millions of people through our community and CSR programmes

Objective	2013/14 targets	2020 vision
Build long-term education partnerships in our communities	<p>Establish an Education Business Partnership Centre (EBPC) at our new Engine Manufacturing Centre</p> <p>Engage 200,000 young people in our UK education programmes every year</p> <p>Develop plan to extend EBPC model to overseas operations</p>	<ul style="list-style-type: none"> <li>• Business and education partnerships that support our core competencies and benefit the wider supply chain</li> <li>• 2 million more young people have participated in our education programmes around the world (baseline 2012/13)</li> </ul>
Develop design and technology skills for the engineers of the future.	<p>Assess our future green skills needs</p> <p>Deliver training and educational advancement through Advanced Technical Accreditation Scheme and other courses</p>	<ul style="list-style-type: none"> <li>• Sustainable design and technology skills are considered key competencies across the business</li> </ul>
Make a positive contribution to our communities	<p>Develop a global community strategy and guidance for overseas operations and National Sales Companies</p> <p>Define and report robust community investment and impact measures, including the number of lives improved across all CSR programmes</p>	<ul style="list-style-type: none"> <li>• 5 million lives improved through demonstrable long-term positive impacts from our engagement with local communities</li> <li>• Jaguar Land Rover recognised as a leader in delivering positive outcomes in society</li> </ul>
Develop our people and our communities by promoting employee volunteering	<p>Achieve a 6% employee participation rate in volunteering activities</p>	<ul style="list-style-type: none"> <li>• Jaguar Land Rover achieves leading levels of volunteering with 15% of employees participate in volunteering activities</li> </ul>
Contribute to humanitarian efforts and nature conservation	<p>Continue our partnership with the International Federation of Red Cross and Red Crescent Societies (IFRC)</p> <p>Continue our long-term relationship with the Born Free Foundation to improve conservation</p>	<ul style="list-style-type: none"> <li>• Recognised globally for its commitment to improve lives through our humanitarian programmes</li> </ul>
Support global communities by investing in CO <sub>2</sub> offsetting projects	<p>Refine our CO<sub>2</sub> offsetting programme to deliver further demonstrable improvements in people's lives (such as health benefits) around the world</p>	<ul style="list-style-type: none"> <li>• 5 million lives improved and 5 million tonnes of CO<sub>2</sub> offset through our CO<sub>2</sub> offsetting projects</li> </ul>

# Advancing Knowledge

Investing in education and securing a pipeline of talented young engineers is fundamental to our ability to achieve our ambitious global growth plans. We focus on promoting Science, Technology, Engineering and Mathematics (STEM) subjects to young people from primary school through to university, and provide apprenticeships, graduate positions, work experience and further education opportunities for talented individuals both within and outside the business.

## Inspiring tomorrow's engineers

We are committed to advancing the knowledge of 2 million young people by 2020. Over the past decade, we have delivered engaging education programmes, and forged long-term partnerships with local schools, to support the UK Government's STEM agenda and boost young people's interest in core technical subjects.

Our aim is to address the national shortage of engineers, improve standards and inspire a new generation of skilled engineers and technologists. This will increase the talent pool for Jaguar Land Rover's apprenticeship and graduate schemes, support the growth of our business and benefit the UK economy.

More than 200,000 young people from 5,000 schools participated in our national STEM programme, Inspiring Tomorrow's Engineers, in the 2012 calendar year. The success of this programme saw Jaguar Land Rover win the BITC 2013 Education Award. 95% of teachers from our partner schools reported that students' engagement with STEM subjects increased as a result of the programme. We also introduced Young Women in the Know, a new course designed to challenge outdated perceptions of engineering and inspire more young women to consider engineering and manufacturing careers (see case study, page 70).

In 2012, our employees led structured work experience opportunities for 407 pupils aged 14-16, our five Education Business Partnership Centres ran visits for 22,184 students, and we won BITC's Work Inspiration Award 2013, recognising our commitment in this area. We also sponsored the UK's largest celebration of STEM subjects - the Big Bang Young Scientist and Engineer Fair, in March 2013. The fair attracted 65,000 students and 25 employees, mainly apprentices and graduates, volunteered to help during the four-day event.



## Making learning fun with exciting challenges

The number of students participating in the Jaguar Primary School Challenge has more than doubled since 2011, with 3,972 students aged 5-11 from 140 schools using design software to create and race model race cars in the 2012/13 academic year.

A further 651 students took part in the Land Rover 4x4 in Schools Challenge and built radio controlled four-wheel drive vehicles which they drove around a challenging course. Both competitions are designed to apply STEM skills to practical projects that provide a flavour of the diverse challenges encountered by our engineers on a daily basis.

The longstanding Jaguar Maths in Motion competition remains the largest mathematics challenge of its kind in the UK, attracting entries from 200,000 pupils in 2011/12. Small teams of students use tried and tested software to simulate the preparation of a race car using a variety of maths skills and compete to achieve the fastest time in a Grand Prix style race.

## Promoting STEM in schools

We continue to reinforce our relationships with local secondary schools through our participation in Business in the Community's Business Class initiative. We support our five partner schools by helping deliver STEM engagement projects, encouraging participation in the Inspiring Tomorrow's Engineers activities such as national challenges, visits and work experience, promoting routes into employment and collaborating with teachers to develop programmes drawing on our expertise.

As the new principal sponsor of the Warwick Manufacturing Group Academy for Young Engineers, we are also taking a leading role in developing the curriculum of its new STEM-based courses for pupils aged 14-19. We will deliver real-world experience and equip the academy's pupils with employability skills.

Meanwhile, we are also on the judging committee and helping to develop course content for the 2013 Design and Technology Challenge in partnership with Alupro, an organisation that supports the industry's obligation to meet recycling targets for aluminium. This competition, aimed at students aged 11-14, presents entrants with three design challenges relating to vehicles, building and packaging and provides learning resources about the role of aluminium in sustainable design.



## Nurturing talent

By nurturing talent both within our company and beyond, we will develop a strong, technically astute workforce to grow our business.

As well as working in close partnership with schools and universities to share our technical expertise and encouraging students to consider engineering and manufacturing careers, we offer a range of opportunities to enable talented people to develop their skills and qualifications, and gain valuable practical experience. Students can apply to join us as apprentices or graduates and we also support existing employees who want to further their education and develop knowledge that will further our business goals.

Inspiring young people to join the automotive industry and offering them structured training is central to our aim to stimulate long-term interest in engineering and manufacturing careers. We employed 312 graduates in 2012/13 via the Jaguar Land Rover Graduate Development Programme (see Developing Our People, page 65). We also increased our apprentice intake to 189 and offered 95 industrial work placements to undergraduates.

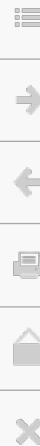
## Supporting higher education

We expanded our pioneering education programme, the Technical Accreditation Scheme (TAS), by launching a groundbreaking modular Master's degree. The first of its kind, the Advanced Skills Accreditation Scheme was developed by Jaguar Land Rover in partnership with leading UK universities. It offers engineers working in the automotive supply chain and other hi-tech industries the opportunity to develop the skills required to meet future sustainability and engineering challenges. This kind of learning is vital to creating world-leading products and technologies for our changing customer base. Our eight university partners are Warwick, Loughborough, Cranfield, Coventry, Bradford, Southampton, Aston and York.

We also support employees wanting to obtain qualifications relevant to their work through our Applied Engineering Programme, a part-time degree course (see Developing Our People, page 67).

Jaguar Land Rover is collaborating on a number of advanced research projects with UK universities, including the development of virtual engineering capabilities (see Sustainable Products, page 25). Our in-depth research coupled with our rigorous education programmes help to enhance our engineering capability and ensure that we continue to develop advanced, sustainable technologies.

Building skills	2011/12	2012/13
Apprentices taken on	114	189
Graduates joining Graduate Development Programme	337	312
Undergraduate industrial placements (3-15 months)	66	95







Launch of new youth training programme, Inspiring Tomorrow's Engineers.





LifeStraw® Carbon for Water Project, Kenya. Photography: Kate Holt.



# Improving Lives

We are committed to making a positive impact in the communities where we operate and beyond. As part of our sustainability strategy for 2020, we plan to improve the lives of 10 million people worldwide by continuing to use carbon finance to deliver development benefits, supporting our charity partners, investing in local projects around the world and promoting employee volunteering.

## Supporting sustainable development projects through CO<sub>2</sub> offsetting

Since 2007, we have contributed to sustainable development by investing in more than 60 CO<sub>2</sub> offsetting projects in 18 countries. Through these projects, we have improved the lives of 2 million people and will offset 10 million tonnes of CO<sub>2</sub> by the end of 2013.

Working with offset provider, ClimateCare, a leading organisation focusing on using carbon offsetting to support sustainable development, we invest in CO<sub>2</sub> offset projects that are designed to deliver social and economic benefits for communities in developing countries, as well as reducing emissions. We focus on projects that deliver safe water or improved air quality, such as the award-winning Carbon for Water project in Kenya (see case study, page 87) and programmes to distribute fuel-efficient cookstoves.

Smoke from open fires and rudimentary cookstoves is responsible for 4 million deaths a year.<sup>1</sup> We have improved the lives of 1 million people in Uganda, Ghana and Cambodia by providing clean and efficient cookstoves. These stoves use less fuel, saving families money and reducing carbon emissions as well as reducing the toxic fumes that cause health problems.

In addition, we have supported 49 renewable energy projects that reduce the use of fossil fuels, provide reliable power supplies to remote communities, stimulate local economies and improve life for local residents. Through these projects we have funded the generation of 7.4 million MWh of clean energy, enough to power London for 49 days.

All projects funded by our offsetting programme go through a rigorous validation and verification process, following United Nations protocols and complying with established standards for voluntary offsets, including the Gold Standard, the Social Carbon Standard, and the Verified Carbon Standard. The carbon offsetting programme is overseen by a committee that includes ClimateCare and Jaguar Land Rover representatives. Chaired by Forum for the Future, the committee meets quarterly to review progress and agree project investments.

<sup>1</sup>UN Global Alliance for Clean Cookstoves



## Refining our approach

In 2012, we undertook research to understand the views of customers around the world on our 360 degree approach to operating as a responsible business, in particular our CSR and CO<sub>2</sub> offsetting activities. They agreed that our priority should be to continue investing to make our products and manufacturing operations more efficient and sustainable. And they felt this should be supported by a CSR strategy that delivers more benefits to the global communities that we operate in.

They told us that they like the CO<sub>2</sub> offsetting projects we have invested in, and are keen to support a lower-carbon world and contribute to wider social benefits. But they also told us that they find the carbon offsetting mechanisms difficult to understand and would like us to maintain the social benefits without engaging them on the process.

In response to this feedback, we have changed the way we deliver and fund our global corporate social responsibility programmes. We will maintain our support for charity partners and continue to invest in CO<sub>2</sub> offsetting projects to offset emissions from our manufacturing assembly operations. In addition, we have established a new fund for local projects nominated by our National Sales Companies.

We will continue to offset emissions from the first 75,000km (45,000 miles) driven by Land Rover customers in 10 participating countries between March 2012 and December 2013. CO<sub>2</sub> offsetting will not be linked to customer purchase of our vehicles from the 2014 model year onwards, but we will maintain the same level of investment to support communities by distributing funding through local projects which will be central to our Global CSR programme going forward.

## Measuring impact: what does Improving Lives and Advancing Knowledge mean?

We want to make sure the projects we support make meaningful improvements in people's lives. Working with the London Benchmarking Group, we have developed a framework to help us understand how each project will improve lives and how to measure this impact. Examples include:

Objective	Measure
Improving people's skills or personal development	Number of children with better engineering knowledge after completing a school challenge or completing an education activity
Changing people's behaviour or attitudes	Number of people who are more energy efficient after an environmental campaign
Improving people's general wellbeing	Number of people with access to clean drinking water as a result of a humanitarian contribution

By focusing on outcomes, we can ensure that our funding makes a sustainable difference in ways that are most relevant to the communities we support around the world.

## Case Study

# LifeStraw®

Waterborne diseases pose a major threat to human health in Kenya's Western Province, where 90% of people lack access to safe water and diarrhoea remains the country's third highest cause of death.

Working with our offsetting provider, ClimateCare, we are helping around 728,000 people across the entire Busia region access clean drinking water through the groundbreaking LifeStraw® Carbon for Water project. ClimateCare developed the methodology that enables businesses to use carbon credits to offset their emissions and fund projects that deliver large scale programmes that provide clean water, such as this one.

Through our CO<sub>2</sub> offsetting programme, we support the distribution of LifeStraw® Family filters - filters that use gravity to produce clean and safe water without the need for electricity or consumables like firewood - to households and schools. Families using the filter can access up to 18,000 litres of purified water over three years, or approximately 4.1 litres a day for a family of four.

Using the LifeStraw® filters cuts CO<sub>2</sub> emissions by reducing the need to boil dirty river water – our contribution will equate to offsetting 800,000 tonnes of CO<sub>2</sub>. This in turn means women and children spend less time exposed to smoky fires in the home, which can lead to serious respiratory illnesses. By reducing the need for firewood, this also helps to prevent deforestation.

Kenyan families are also benefiting from health education as part of an integrated health programme, which distributed the filters and employed 8,000 Kenyans as health workers and drivers. Our continued support of this project will contribute to meeting the UN's Millennium Development Goal of halving the number of people without sustainable access to safe water and basic sanitation by 2015.

Oxford University is currently undertaking an evaluation to establish the health impacts of the LifeStraw® using data captured by health workers on mobile phones.





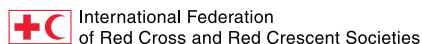
# Global charity support

We donated over £1.7m to local charities in cash and in kind in 2012/13 and strengthened our major charity partnerships. By forming good relationships with communities and supporting local initiatives, we aim to enhance the sustainability of both our business and the communities in which we operate.

We channel much of our charity support through our partnerships with:

## International Federation of Red Cross and Red Crescent Societies (IFRC)

Land Rover has provided £6.4 million in support of global Red Cross initiatives since 2007, reaching over 830,000 vulnerable people. Our three-year joint global initiative, Reaching Vulnerable People around the World, has sustained life-saving work in 15 countries. The project aims to rebuild communities in regions affected by crisis, such as Sierra Leone, and help people to become more resilient in the face of disasters. It also seeks to deliver much-needed healthcare and access to safe water. Land Rover's all terrain vehicles enable the Red Cross to reach vulnerable people in remote locations where lack of road infrastructure means access is over harsh terrain.



## Royal Geographical Society (with IBG)

Land Rover supports the Royal Geographic Society (with the Institute of British Geographers) by funding research expeditions designed to develop new knowledge and advance geographical science. Our annual bursary, first awarded in 2007, is granted to those whose journey will push them beyond their limits in the pursuit of geographical and scientific research. The 2013 bursary of £30,000 and the loan of a Land Rover Defender was awarded to Pole of Cold Expedition, a team from the UK that will examine how remote communities across the northern hemisphere – from London to Siberia's Pole of Cold – deal with the onset of winter.

## BEN

Jaguar Land Rover continues to support BEN, a charity that provides support for existing and former members of the automotive industry when they are in need. We donate 70p to the charity for every vehicle sold, raising £49,290 in 2012/13. We also provide the BEN welfare team with facilities at Castle Bromwich, worth £15,000 per year. Our employees volunteered to support projects at BEN's sites, held a BEN Awareness Day and raised £3,000 in a charity bike ride. Our Head of Community Relations sits on BEN's board of trustees.



## National Society for the Prevention of Cruelty to Children (NSPCC)

Jaguar has raised £2.4 million for UK children's charity the NSPCC since 1994. Jaguar chairs the NSPCC Coventry and Warwickshire Business Group, an alliance of like-minded businesses that support the NSPCC through various fundraising events and activities. In 2012/13, we raised £100,000, including £60,000 at a high profile fundraising ball in Coventry, in which Jaguar was one of the lead supporters.

## Born Free Foundation

Land Rover has partnered with the Born Free Foundation since 2002, supporting conservation projects that protect wild animals and their habitats. In addition to providing vehicle support in Ethiopia, Kenya, Sri Lanka, South Africa and the UK, we also run events and dealer promotions, and encourage our employees to support the charity's work. Our donations have most recently helped to support a project in Kenya to build lion-proof fences designed to protect community livestock from lion attacks – in turn helping stop community members killing lions in retaliation. As part of our work with Born Free, we also raised £75,000 for the Tiger Tracks Programme that funds vital conservation work and raises public awareness of threats that could render the tiger extinct within 10 years.



# Inspiring employees to engage with the community

Jaguar Land Rover employees dedicated more than 17,000 hours to volunteering in the community in 2012/13. We work with local authorities, community groups and our employees in the West Midlands and Merseyside to identify initiatives that need support.

Employees can spend up to 16 hours of work time on approved volunteering projects annually. In 2012/13, volunteers focused on regeneration and environment projects, education and support for young people, and charity work. Team projects included improving community facilities, while individual volunteers took on responsibilities such as school governors, Justices of the Peace, or helping pupils with maths, business and engineering-related subjects.

In addition to contributing to the community, employees also gain valuable skills and team-building opportunities that enhance their personal development and benefit our business.



“Jaguar prize competition to raise £1m for the NSPCC helplines.”

## Jaguar Land Rover community contributions in 2012/13

Charitable giving donation <sup>2</sup>	£115,000
Employee volunteering time	17,000 hours
Management costs in kind	£1,580,000

<sup>2</sup>Charitable giving donations include donations from Jaguar Land Rover to local charities. Global charity partnerships and employee fundraising is not included in this figure.

# Performance Summary Table

All manufacturing data for 2007 to 2009 has been restated to exclude the Browns Lane veneer manufacturing facility, which was sold in 2010.

Due to a change in our reporting procedures, data is now reported for the fiscal year (FY) from April to March unless explicitly stated as calendar year (CY).

Jaguar Land Rover Fleet Tailpipe CO <sub>2</sub> Emissions		2012 (CY)	2011 (CY)	2010 (CY)	2009 (CY)	2008 (CY)	2007 (CY)
EU fleet average CO <sub>2</sub> emissions per kilometre (g/km)		187	206	223	228	236	240
Manufacturing impacts		2012/13	2011/12	2010/11	2009 (CY)	2008 (CY)	2007 (CY)
Energy	Total energy use (MWh)	1,159,988	1,022,418	984,016	811,510	1,026,334	1,072,691
	Energy used per vehicle produced (MWh /vehicle)	2.99	3.18	4.13	5.13	3.92	3.69
Emissions	Total CO <sub>2</sub> emissions (tonnes)	334,180	297,739	274,825	236,026	301,591	317,280
	CO <sub>2</sub> emissions per vehicle produced (tonnes per vehicle)	0.86	0.93	1.15	1.49	1.15	1.09
Waste	Total waste (thousand tonnes)	18.27	15.29	11.45	10.78	19.99	18.09
	Waste per vehicle produced (kg /vehicle)	47.26	47.55	48.06	68.22	76.36	62.23
Water	Total water use (m <sup>3</sup> )	1,150,263	1,008,820	883,403	730,272	1,038,404	1,052,208
	Water use per vehicle produced (m <sup>3</sup> /unit)	2.97	3.14	3.71	4.62	3.97	3.62
Solvents	Total solvents used (tonnes)	1,542	1,632	1,392	1,152	1,325	1,484
Non-Manufacturing impacts		2012/13	2011/12	2010/11	2009 (CY)	2008 (CY)	2007 (CY)
Energy	Total energy use (MWh)	113,517	93,418	99,843	91,849	102,983	95,471
Emissions	Total CO <sub>2</sub> emissions (tonnes)	43,660	37,633	38,488	35,606	40,297	37,688
Waste	Total waste (thousand tonnes)	1.26	1.17	1.28	1.74	1.17	1.76
Water	Total water use (m <sup>3</sup> )	146,405	129,720	144,771	139,191	139,437	131,601

\*\* 2009 data restated. previously data reported for % of management as approx top 1,500 employee  
 \*\*\* 2009 data restated. previously data reported for % of senior management as approx top 1,500 employees

Our People		2012/13	2011/12	2010/11	2009 (CY)	2008 (CY)	2007 (CY)
Employees	Number of employees	24,913	23,848	14,974	14,605	14,975	15,135
<b>Training and development</b>		<b>2012/13</b>	<b>2011/12</b>	<b>2010/11</b>	<b>2009 (CY)</b>	<b>2008 (CY)</b>	<b>2007 (CY)</b>
Employee Development	Number of days training provided	51,682	42,425	21,851	14,560	–	–
<b>Health, safety and wellbeing</b>		<b>2012/13</b>	<b>2011/12</b>	<b>2010/11</b>	<b>2009 (CY)</b>	<b>2008 (CY)</b>	<b>2007 (CY)</b>
Reportable incidents	Number of reportable incidents (under RIDDOR)	40	47	60	50	52	76
Lost time case rate	Number of lost time cases per 200,000 hours worked	0.17	0.20	0.22	0.21	0.35	0.49
Occupational absence rate	Number of days lost per 200,000 hours worked	1.6	2.64	2.79	2.81	4.66	8.47
Occupational health	Number of first time visits to occupational health centre	701	716	663	729	1,245	1,574
<b>Diversity</b>		<b>2012/13</b>	<b>2011/12</b>	<b>2010/11</b>	<b>2009 (CY)</b>	<b>2008 (CY)</b>	<b>2007 (CY)</b>
Gender diversity	% women in workforce	9	9	8	8	–	–
	% women in management (approx top 1,800 employees)	13	12	12	11**	–	–
	% women in senior management (approx top 125 employees)	7	5	5	3***	–	–
Ethnic diversity	% ethnic minorities in workforce	8	8	8	8	–	–
	% ethnic minorities in management (approx top 1,800 employees)	5	6	5	5	–	–
	% ethnic minorities in senior management (approx top 125 employees)	2	3	1	2***	–	–
<b>Global Corporate Social Responsibility</b>		<b>2012/13</b>	<b>2011/12</b>	<b>2010/11</b>	<b>2009 (CY)</b>	<b>2008 (CY)</b>	<b>2007 (CY)</b>
Charity support	Amount donated (in cash and in kind) (GBP millions)	1.7	1.4	1.4	1.3	1.4	1.3



Visit [www.jaguarlandrover.com](http://www.jaguarlandrover.com) to see how we are striving to:

- Reduce environmental impacts across the product life cycle to create innovative low-carbon vehicle solutions for our customers of the future
- Invest in our people and create sustainability change
- Develop skills and nurture talent to build a sustainable future
- Demonstrate leadership in sustainable business throughout our operations and our supply chain
- Improve the lives of millions of people through our community and CSR programmes

**Address:**

Jaguar Land Rover, Abbey Road, Whitley, Coventry, CV3 4LF