Enabling the Transition to a Green Economy: Government and business working together

The Transition for the Automotive Industry

HM Government

Sector Overview

The automotive manufacturing sector accounts for over 300,000 UK jobs (12% of UK manufacturing employment) and a further 480,000 jobs in the motor retail sector.

Of this total, there are around 2,350 component manufacturers in the UK, ranging from international players to small and medium-sized businesses, employing over 80,000 people.

Automotive products are the biggest UK-manufactured export and account for over 10% of the UK's total export values, reaching £23.8 billion in 2009. In 2010, 75% of cars, 73% of commercial vehicles and 72% of engines that were made in the UK were exported.

The sector adds nearly £6.5 billion in value to the UK economy per annum. In 2010, it produced over 1.39 million vehicles and 2.4 million engines. For example, Toyota is manufacturing the Auris electric-petrol hybrid car in Derby and the engine for it in Deeside. The Auris is the first mass-produced hybrid to be manufactured in Europe.

22% of UK domestic carbon dioxide (CO_2) emissions are from transport, of which 93% are from road transport. Of road transport, passenger cars make up 70.3% and HGVs 18.4%. Road transport is also a significant contributor to harmful air pollution, particularly in urban areas. Reducing emissions from road transport is an important element of Government's plans to combat overall emissions.

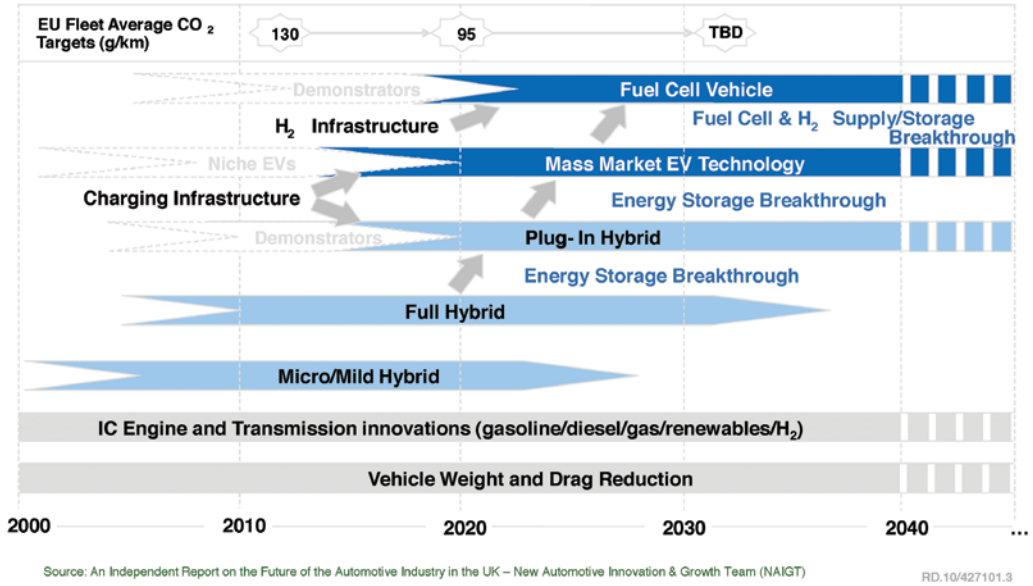
Working together as an industry

In 2009, the UK automotive industry came together to develop a report to map out the strengths and weaknesses of the industry and proposed key recommendations to support the future of the automotive industry in the UK. These recommendations formed the basis of the automotive technology roadmap and the creation of the Automotive Council.

The Automotive Council Technology Roadmap

Individual manufacturers will prioritise certain technologies to fit with brand values, but OEMs share a common view of a high level Technology Roadmap

automotive council UK



Source: An Independent Report on the Future of the Automotive Industry in the UK – New Automotive Innovation & Growth Team (NAIGT)

RD.10/427101.3

The Automotive Council Technology Roadmap for passenger cars (with the equivalent heavy duty vehicle roadmap to be published soon) charts the development of new technology required to decrease vehicle CO_2 emissions in the automotive sector over the next 30 years. Agreed by both industry and Government, the Roadmap ensures that the automotive industry has a clear route to deliver a low-carbon road transport future, with a portfolio of technology solutions anticipated.

The Roadmap illustrates that new electric-powered vehicles are not the only low-carbon element of the industry: both reducing vehicle weight and improving internal combustion engines play an important role in reducing vehicle emissions, especially as, despite the anticipated growth in the ultra-low emission vehicle market, traditional vehicles will make up the majority of road traffic for the foreseeable future.

Industry working with Government

The Automotive Council was established as a joint Government-industry body. Co-chaired by Vince Cable and the leading automotive industrialist, Richard Parry-Jones, it acts as a key driver for the implementation of change within the automotive industry. Its key aims are to:

- Establish a business environment in the UK where there is a more compelling investment proposition for automotive-related industries and their supply chain;
- Maintain a strong dialogue between Government and industry to provide a stronger public voice for the sector to support the value of the industry to the UK and to global partners;
- Develop further the technology roadmaps for low-carbon vehicles and fuels, and exploit opportunities to promote the UK as a strong candidate to develop these and other technologies.

The transition to ultra-low-emission vehicles offers commercial supply chain opportunities to UK companies. The Government, working closely with partners, including UK Trade and Investment (UKTI), the Technology Strategy Board (TSB), Automotive Council and the Society of Motor Manufacturers and Traders (SMMT), aims to ensure the UK is well placed to take advantage of these opportunities. Through events and dialogues with industry, Government ensures that manufacturers are fully aware of the opportunities available to them with regard to new technology and the requirements of vehicle manufacturers who are interested in sourcing products in the UK.

The global context

The sector's transition should be considered on a global scale. Many other countries are also looking to meet CO_2 reduction targets and/or encourage industry to take advantage of the emerging opportunities from the transition to lower-emission vehicles. This presents both opportunities, including exports, and challenges in terms of developing and maintaining competitive advantage. For example, both China and the US have announced large programmes to support the development of ultra-low-carbon vehicle technology.

The move to a green economy provides a real opportunity for UK-based businesses to be a part of a new and growing market sector, providing the potential for the creation of new jobs and economic growth. The UK is in an ideal place to take advantage of this global change, with £1.5 billion invested annually in automotive research, and proven excellence in automotive innovation: eight out of twelve Formula One teams are based in the UK.

Investing in research

The UK has a strong R&D base. Over £1.5 billion is invested in the UK annually on automotive R&D. Ford alone has committed to investing £1.5 billion over 5 years to develop low-emission and more fuel-efficient engines in the UK.

Government-funded R&D into low and ultra-low carbon vehicle technologies is being delivered though the Technology Strategy Board (TSB), which brings together all relevant strands in the Low Carbon Vehicle Innovation Platform (LCVIP).

The LCVIP is investing jointly with the industry and other funders in interventions that promote UK-based R&D in low-carbon vehicle technologies, and strengthen the supply chain within the UK. It was launched in September 2007 and has delivered a wide range of research projects targeted at low- and ultra-low vehicle technologies including investigations into lightweight structures, flywheel and kinetic energy recovery, range-extended electric vehicles, hydrogen electric fuel cells and step-change improvements to more conventional internal combustion engines.

The low- and ultra-low Carbon Vehicle Demonstrator Project is a trial of over 340 electric and plug-in-hybrid cars in eight locations around the UK. The trial is providing important data on the real world use and performance of electric vehicles, driver behaviour and recharging issues.

Further details of individual projects can be found at www.innovateuk.org.

Innovation

There is an opportunity for the UK, with its innovative expertise in the automotive sector, to take the lead in reducing the weight of vehicles. Advances in this field would have a universal impact as they would be relevant for all types of vehicle. However, challenges exist, as new materials are often more expensive to produce and can be more energy intensive to create (such as carbon fibre shells).

Gordon Murray Design is a new British company based in Surrey. The design team has considerable experience in automotive innovation and design, with a background in motorsport and high-performance cars. Using this expertise, they have developed a highly innovative manufacturing process.

Through careful selection of materials, the overall weight of the Gordon Murray T.25 vehicle is 550kg, which is considerably lighter than comparative small vehicles. This reduction in weight improves component life, allows a higher fuel efficiency and enables a higher power-to-weight ratio to be achieved, making alternative powertrain options viable, such as all-electric and range extended electric.

There is considerable scope for a greener sector by enhancing current combustion engines. More efficient engines would consume less fuel per mile and therefore produce less CO_2 and other emissions. The UK has a strong pedigree in engine design and development and is in a strong position, leading the market in the design and production of greener combustion engines.

Flybrid Systems LLP is a British company set up in 2007, with expertise based in the Formula One industry. They developed a viable flywheel system for large scale manufacture in standard vehicles, having created the relevant technology for use in motorsport. When used in a conventional road vehicle, the flywheel can reduce emissions by up to 20-30% in real life situations.

The UK hydrogen and fuel cell sector has the potential to be a significant green success story, helping meet UK carbon emissions, air quality and energy security goals, whilst delivering green jobs. It is generally accepted that hydrogen will play a role in the decarbonisation of the UK transport sector. The technology is beginning to emerge into the market and the UK is well placed to exploit it, with a number of SMEs already operating in the hydrogen and fuel cell sector.

An example of UK expertise is the TSB-funded Fuel Cell Black Cab collaboration, which successfully delivered an operating prototype taxi in June 2010. Not only did the project produce a vehicle with a zero emission range of over 250 miles, it also improved the road performance of the equivalent combustion engine black cab.

Resource efficiency

Through continuing research and innovative practice to improve both the manufacturing process and recycling techniques, in line with EU targets, over 85% of end-of-life vehicles are now recovered in the UK. In the six years since the industry began collecting waste recycling data, recycling per vehicle produced has increased by 110%. In 2009, the weight of waste sent for recycling increased by 23kg, to reach 164kg per vehicle produced. In addition, waste to landfill has fallen to an all-time low of 10.8kg per vehicle, and 12 times more waste products in the manufacturing process were being recycled than was sent to a landfill site.

By reducing material and manufacturing costs, manufacturers can produce products at a cheaper price and therefore increase their competitiveness. With emissions having a viable cost through the European Trading Scheme, the sector also looks to reduce their carbon footprint as part of their considerations of cost.

WBC Automotive wanted greater control over energy costs and to improve their green credentials. The company applied for an interest-free loan from the Carbon Trust to replace two paint spray booths. This change both allowed WBC Automotive to adhere to the very latest paint shop standards and allowed them to cut CO_2 emissions by 2,500 tonnes per year. The change also enabled the company to save £38,000 a year, enabling them to payback the loan over three years. (Carbon Trust)

Developing an early market for ultra-low-emission vehicles

There is currently a price premium for ultra-low-emission vehicles. High-tech components required specifically for the new technologies are expensive, especially as they are being manufactured in low volumes. Boosting demand will incentivise these components being produced in higher volume, with increased efficiency driving down costs and incentivising manufacturers to innovate with new technologies that are not yet fully commercially viable.

To encourage demand and to create a flourishing early market, the Government is offering a technology-neutral Plug-In Car Grant (PiCG) for Ultra Low Emission Vehicles. The grant reduces the price of eligible vehicles, reducing the upfront cost and bringing the total cost of ownership in line with similar-sized traditional vehicles.

A structured programme to install the appropriate infrastructure allows industry to innovate knowing that there is a clear strategy and timeline that will enable those technologies (such as electric, and later hydrogen) to be viable in the UK.

The Government's Plugged-In Places scheme offers funding to support the cost of installing plug-in vehicle charging infrastructure in locations across the UK. Each Plugged-In Place plans to trial different technologies and operating models and will provide valuable information that will inform the development of a national network of recharging infrastructure for plug-in vehicles.

In June 2011 the Government published its Strategy for Plug-In Vehicle Infrastructure which sets the framework for further development of the national recharging network. As part of this it removes a number of barriers to enable commercial provision of infrastructure, which some forward-thinking businesses have already responded to.

Any enquiries regarding this document/publication* should be sent to us at [insert contact for department]. This publication is available for download at www.official-documents.gov.uk.