

Investing in the low carbon journey

Lessons from the first decade of UK policy on the road to 2050

Prepared for the
LowCVP by E4tech with
Cardiff Business School



Executive Summary July 2014



A decade of achievement

A decade ago the UK automotive sector was in a state of decline and a continuation of this trend was seen as inevitable in many circles. Factory and company closures were commonplace, innovation levels were modest, the UK supply chain had become ‘hollowed out’, and environmental regulations were seen as a threat by some in the industry. The ‘reactive era’ of the early 2000s, when automotive policy was preoccupied with closures and restructuring, started to change with the report of the Automotive Innovation and Growth Team (AIGT) in 2002 which stated “we believe that the (automotive) industry can have a long term future in the UK provided that industry and Government work together.” The agenda AIGT set out included improving efficiency in manufacturing, supporting commercialisation of technologies and tackling environmental challenges through a multi-stakeholder group.

The last recommendation was taken forward with the establishment of the Low Carbon Vehicle Partnership (LowCVP) in 2003 which, constituted with an unprecedentedly broad range of stakeholders, began to create a bridge between industry, government and green groups with a view to reconciling commercial and policy pressures with environmental imperatives. Subsequently, the cumulative impact of consistent policy emphasis on environmental achievement and green growth has provided the foundations for a renaissance of the UK automotive sector. The past ten years have seen some great achievements in the sector, despite a global recession and strong competitive pressures, leading to benefits for companies, drivers and the nation, including:

- Automotive manufacturing sector turnover climbed from £46.3bn in 2003 to £64.1bn in 2013.

- Rapid recovery in new car production following the 2009 global financial crisis, reaching 1.5 million units in 2013, having fallen to below 1 million in 2009. Production is now almost back to pre-recession levels.
- Exports account for 77% of UK car production, up from 70% a decade ago, and volumes reached a record 1.2 million units in 2012 and remained at this level in 2013.
- Major capacity expansions, new model programmes and reinvestments by BMW, Ford, Honda, Jaguar Land Rover, Nissan, Toyota and Vauxhall.
- Productivity per worker up 45% from 2003 to 2013.
- Healthy UK bus and coach sector with nine manufacturers and a total UK market of 3,685 vehicles in 2013.

Note: References for this summary may be found in the full report downloadable from the LowCVP website: www.lowcvp.org.uk

Picture opposite: Ford's factory, Dagenham, where some of its range of EcoBoost engines are assembled.



“Back then, environmental regulation was seen as a threat not an opportunity.” AUTOMOTIVE R&D SERVICES COMPANY

- 291 unique low carbon investments by 85 different companies were catalogued for the period 2003–2013.
- Confirmed total value of £17.6 billion in low carbon investments (approximately £40 billion by extrapolation).
- Average new car tailpipe CO₂ emissions have fallen by 25% to below the threshold of 130g/km, ahead of the EU-mandated timetable.
- Average official new car fuel economy has risen from 42.2mpg (2003) to 56.3mpg (2013), reducing costs for motorists.
- Between 2002 and 2012 private consumption of vehicle fuel fell 18% in volume terms per head.
- Rapid uptake of low carbon buses led to over 1,500 in service by 2013. UK a leader in low carbon bus manufacture and uptake.

Whether it be the mainstream manufacturing sector or low-volume niche specialists, suppliers or contract engineers, engine plants or motorsports operations, the sense of a dramatic shift into a vibrant, confident and revitalised industry in the UK is palpable – and this despite the global economic recession of 2008/9 from which much of the industry in the European Union is still struggling to escape.

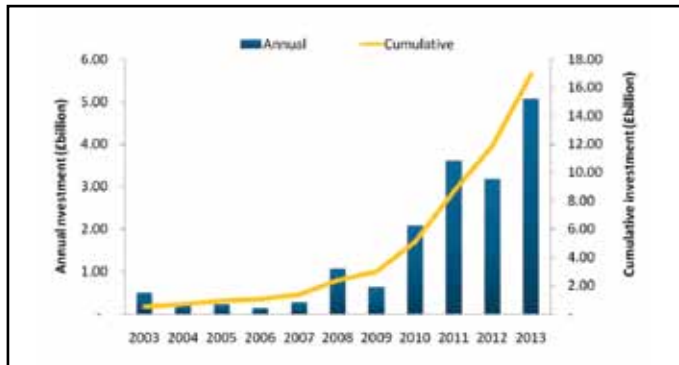


Figure 1: Low carbon investments by year.

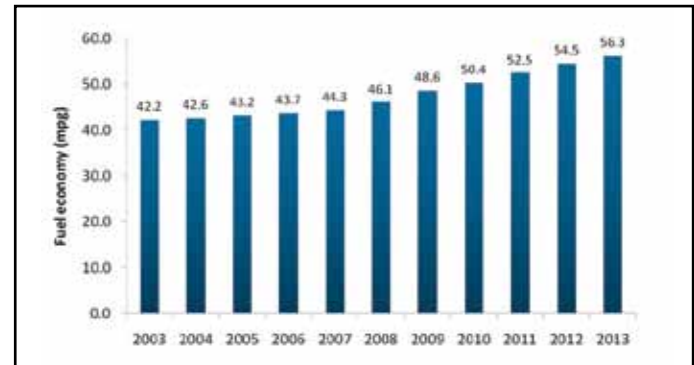


Figure 2: UK new car average fuel economy performance.

Background to the study

The turnaround in the auto sector's fortunes raises some key questions:

How far have low carbon policies and technologies contributed to the resurgence in the UK automotive industry, and what lessons can be learned for the years to come? The Low Carbon Vehicle Partnership (LowCVP) sits at the nexus between government, the automotive industry and other key environmental policy stakeholders, so is well placed to find the answers. The LowCVP commissioned strategic consultancy E4tech and Cardiff Business School to address these questions objectively, drawing upon a wide range of evidence.

The study sought to establish if there has been a causal link between policies that favour low carbon vehicles and the rising levels of UK automotive investment. Evidence was gathered via a broad industry survey, supported by interviews with senior executives, and extensive desk research. Together these provided a rich evidence base from which several clear messages emerged. These are presented in brief in this Executive Summary and elaborated in the main report.

A new era of cooperation between industry and government

Underpinning the revitalisation of the UK automotive industry has been a new era of industry–government relations through the Automotive Council, formed in 2009. This has enabled industry to speak with a common voice, and government to support industry in their common objectives of creating a compelling investment proposition and supporting low carbon opportunities. Complementing this, the LowCVP has mediated a wider debate beyond the specific interests of government and the automotive industry to encompass fuel suppliers, fleet operators, consumers, NGOs, academics and others with an interest in future mobility. The seeds for co-operation were sown over a decade ago, allowing the industry to respond effectively to the economic crisis and maintain course despite changes of government:

- Automotive Innovation and Growth Team (2002) challenged the view of the auto sector as a sunset industry.

- LowCVP (2003) provides a focal point for stakeholder engagement, including NGOs, academics, road users and others, as well as industry and government, on low carbon vehicle policy issues and wider stakeholder engagement.
- Technology Strategy Board (TSB) (2007) and Advanced Propulsion Centre (2013) provide consistent support for innovation.
- New Automotive Innovation and Growth Team (2009) defined the industry's way forward.
- Automotive Council (2009) became the focal point for industry – government dialogue.
- Office for Low Emission Vehicles (OLEV) (2009) and Green Bus Fund¹ (2009) create market conditions for low carbon vehicle uptake
- Regional Development Agencies and, latterly, Local Enterprise Partnerships support automotive innovation and manufacturing at local level.

1. Note that this policy was implemented differently across UK Devolved Administrations:

“Government policy context and strategic goals and targets will have a role to play in the investment decision making environment. It may not be the determining factor – but it will be evaluated positively or negatively.”

MAJOR AUTOMOTIVE MANUFACTURER

In addition, the introduction of binding regulations on new car average CO₂ emissions in the European Union (EU) (2009) provided the Europe-wide certainty for harmonised change for cars (and vans

from 2011), while the longer-term policy stability of the Climate Change Act (2008), King Review (2007, 2008) and Stern Review (2006) should not be underestimated in setting the direction of travel.

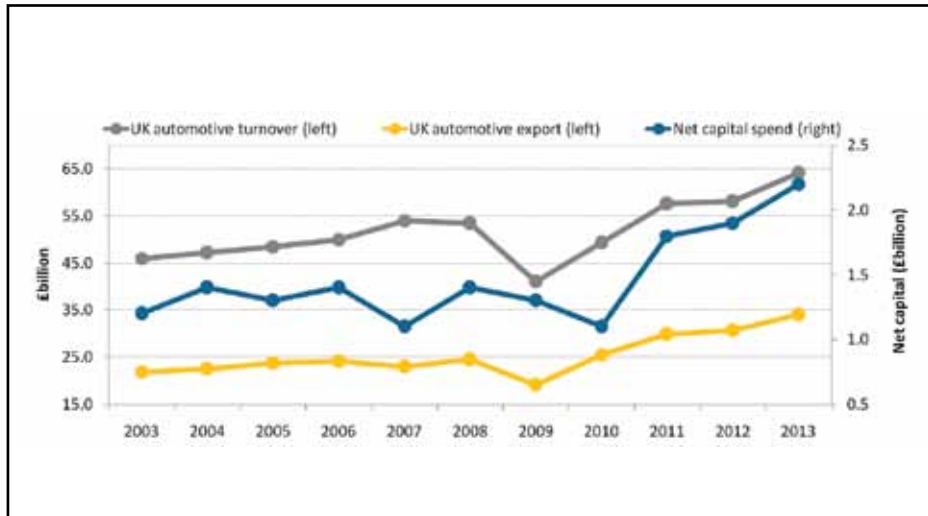
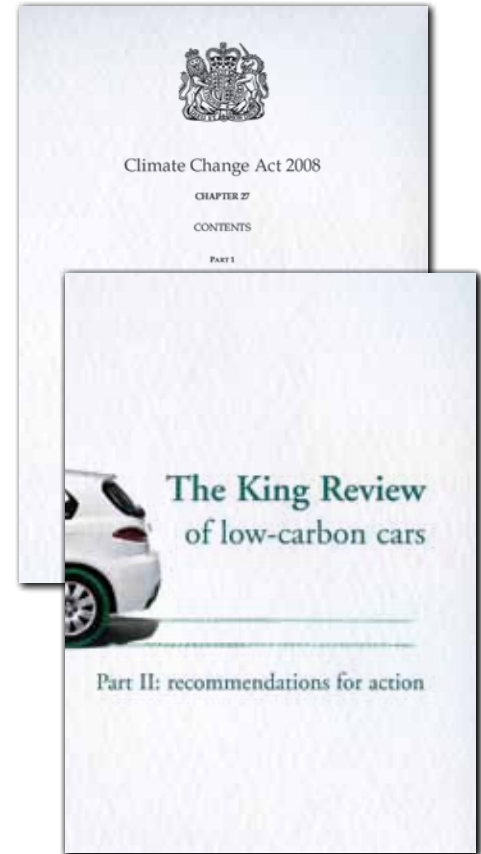


Figure 3: UK automotive sector performance between 2003 and 2013



Automotive investment and low carbon policies

Low carbon automotive investment levels have risen strongly

A strong level of cumulative UK investment was identified by the authors, albeit with some unevenness caused by large investment announcements. Considering investments in R&D and manufacturing for lower and ultra-low carbon vehicles, 291 unique investments by companies were catalogued for the period 2003–2013. These investments were made by 85 different companies with a confirmed

total of £17.6 billion. By extrapolation, the true value of investments is possibly of the order of £40 billion because the database only contains definite values for around 40% of the identified investments, and does not include wider multiplier impacts in the supply chain.

Cumulative investments have risen strongly towards the latter part of this study, suggesting that funding and policy structures have gained increasing traction over time.

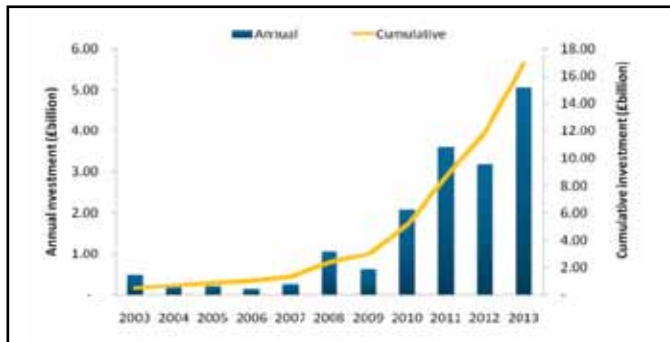


Figure 4: Low carbon investments by year.



Industrial policy has helped to turn the tide

The changing relationship between government and the automotive industry has been pivotal for the transformation of the sector overall. Respondents spoke of the fundamental change since the ‘reactive era’ of the early 2000s when automotive policy was preoccupied with closures and restructuring. The tide had begun to turn but was rapidly accelerated by the economic crisis which hit the global automotive industry with force in 2008–10. The UK’s response included a proactive focus on support for the automotive industry, notably in areas where the UK had a technological basis for competitive advantage, such as powertrain engineering. Several government-supported entities were established and continue to play a key role in the automotive industry; the authors heard ringing endorsement for the Automotive Council in particular, and many were also grateful for the role played by the Technology Strategy Board and, latterly, the Advanced Propulsion Centre.



Low carbon policy has been very influential

UK low carbon policies have emerged strongly in the past 10 years. The formation of the LowCVP in 2003, arising out of the work done by the Automotive Innovation and Growth Team (2002), can in retrospect be seen as an important moment for the UK automotive sector, providing a means for stakeholders to work together to contribute to numerous low carbon vehicle policies, structures and initiatives. The Stern Review (2006), King Review (2007) and Climate Change Act (2008) put CO₂ reduction into law, building a sense of stability in climate change policy with a strong bearing on subsequent UK road transport sector policies.

Low carbon vehicle policies have had a strong influence on UK R&D investment in particular, as illustrated by the survey results below – for example 72% of respondents said UK grant programmes for low carbon vehicles had been influential in their R&D investments. Other initiatives also emerged and are acknowledged to have provided

strong market pull for low carbon investment, notably the Office for Low Emission Vehicles (for cars and vans) and the Department for Transport's (DfT) support for low carbon buses. However, the primacy of the EU's regulations for new passenger car CO₂ has been critical in providing, a 'level playing field' and long term certainty across the whole industry.

Confidence is vital for investment

Investment decisions are taken on the basis of an assessment of risk and reward, and policy confidence is a vital part of reducing risk, especially for the automotive industry with long product development times requiring large capital commitments. Numerous illustrations emerged of how confidence is a result of cumulative effects rather than single policies, with increasingly positive results. In R&D the availability of multi-stage grant programmes has encouraged innovators to start their journey with confidence that they will continue to be supported, if technically viable. In vehicle deployment, OLEV's

long term commitments to low carbon vehicle support are valuable for investors. In manufacturing, senior industry figures reported that collective and cumulative policy measures reinforced the overall confidence that UK Government provides.

In addition to cumulative policy effects, respondents referred to the confidence derived from having a clear channel for dialogue with government (via the Automotive Council and others). Furthermore, importance was attached to the 'intellectual supply chain' that is being developed in the UK, ensuring that ideas can be turned into products through an ecosystem of companies and organisations. Finally, respondents pointed to the UK's membership of the EU as being vital for confidence.

Not everything in road transport policy has gone smoothly

Not surprisingly, there have also been areas where public policy in this sector was not perceived to have succeeded and it is instructive to learn from these. In the



automotive sector the abolition of the Regional Development Agencies caused disruption at a time when the industry was being closely supported in some areas, and new structures were not able to step in quickly. Truck sector respondents pointed to the dearth of policy to support low carbon truck deployment, despite incentives to develop technologies. They also cited the tension between technologies and engineering resources required for CO₂ reduction, and those to meet stringent air quality emission regulations (most recently Euro VI).

The study also examined policy on low carbon fuels, where changes in direction and the complexity of fuel and infrastructure investments in general have provided a less stable investment climate for the companies concerned. This is felt particularly strongly in biofuels where investments have stalled to a large extent.

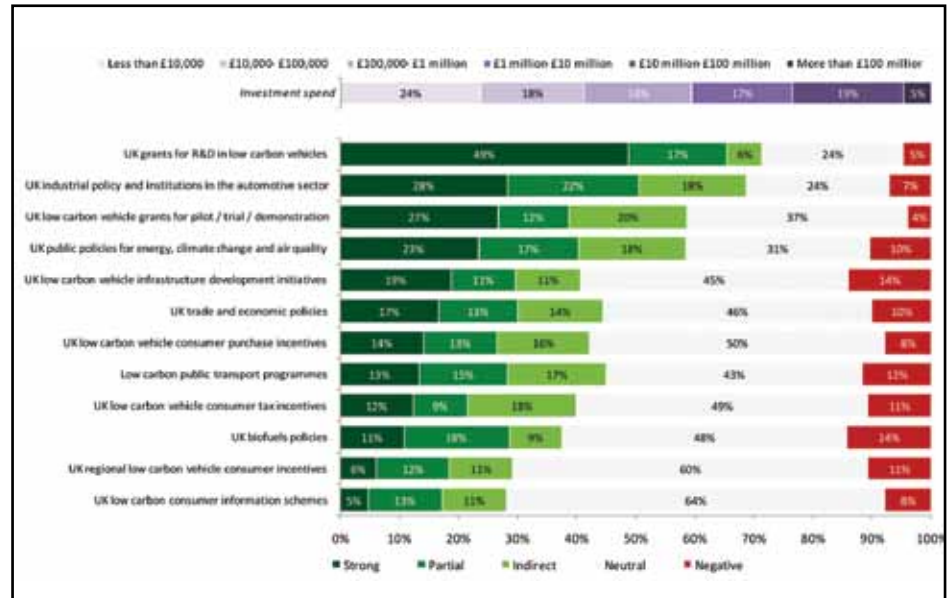


Figure 5: Survey responses: Influence of public policy on research and development investment



Recommendations

The authors use the evidence and their own judgement to make a number of recommendations for policymakers, summarised below and explained in the following sections.

Stay on course:

- Automotive policy frameworks are mostly working well, in particular due to the sense of urgency as well as consistency of policy, which should not be allowed to diminish
- There are other priorities but low carbon must remain a vital area of focus
- Strong emphasis should be placed on the transition from low carbon technology development to manufacturing.

Address remaining automotive sector challenges:

- Attracting further inward investment, especially from component suppliers, would increase UK resilience.
- Future skills needs throughout the supply chain should be supported.
- Low carbon policies need closer alignment with air quality issues.
- A clear framework is required for commercial vehicle efficiency measurement and incentives.
- EU regulations play a key role in harmonising future vehicle CO₂ (and air quality) performance requirements and companies are keen to see the UK influencing this agenda.

Build confidence for the low carbon fuels sector:

- A collaborative approach is needed to define the outlook for automotive fuels.

STAY ON COURSE

The initiatives that emerged from the decline of the UK automotive sector and the economic crisis have proved to be largely successful and should be built upon. However, there is a risk that the new structures will subsequently prove vulnerable if the sense of urgency that led to their creation declines. This vulnerability may be to unexpected events (new technologies, competitors or economic conditions perhaps), or to becoming less agile with time (some evidence was offered of this already becoming the case). The recommendation is therefore to maintain a sense of focus and urgency and continue to stress test all of the low carbon automotive ‘apparatus’ in the UK, ensuring delivery of a common stakeholder mission and attracting further investment. Surrounding this it is very important that the focus on low carbon is maintained, even as other automotive sector priorities such as autonomous vehicles emerge.

“At the highest level, the creation of a level playing field [CO2 target] by the EC was extremely helpful. A clear long term target is what industry needs – it will find a way to respond.” AUTOMOTIVE MANUFACTURER

Much of the low carbon innovation that has occurred in recent years in the UK is approaching technological maturity, but is still some way from manufacturing maturity. For the UK to gain maximum value this journey needs to be pursued to the end with appropriate support, thus ensuring that benefits accrue to the UK rather than being driven offshore.



ADDRESS REMAINING AUTOMOTIVE SECTOR CHALLENGES

The UK supply chain should build up its low carbon (and more general) capabilities, as has already been recognised. The focus of the Automotive Investment Organisation, Automotive Council and others is to reinforce the automotive supply chain in the UK in line with the automotive industrial strategy. This emphasises that UK policy is creating a pull for vehicle development and manufacture, which in turn creates a growing need for a strong supply chain. For low carbon vehicles specifically, the UK's R&D base creates an attractive context for supply chain actors to develop and manufacture close to what is also a major low carbon vehicle market.

Several commentators noted that skills are becoming a challenge for the further development of the UK automotive sector. This relates not just to highly skilled university-level graduates, but also to the future technicians for whom apprenticeships



and other training are needed. The industry, government and relevant skills bodies have already recognised the need to work closely together (for example via the SMMT and Automotive Council) including in the low carbon vehicle areas, to ensure that the UK's prospects are not hampered by skills shortages.

The contribution of low carbon policies to relieving air quality concerns has been underplayed. Urban air quality is a growing area of concern for many cities across Europe, with many episodes in which 'safe' levels of pollutants are exceeded. In some instances the balance between CO2 and air quality needs to be better managed, and some products can be beneficial on both fronts. Noise is another feature that should be considered alongside CO2 and, again, there may be synergies as well as trade-offs.

The pressure for commercial vehicles with ever lower air quality impact has had a fuel efficiency cost according to some. The EC's framework for measuring and comparing



commercial vehicle efficiency (currently in development) is required, which in turn will provide a basis upon which fuel efficiency could be incentivised or enforced. This should be taken forward by the EC with UK oversight from OLEV, the DfT Low Emission HGV Task Force and the LowCVP.

EU policy plays an important role in harmonising vehicle CO₂ emissions targets, as well as providing funding for research. Active UK participation in shaping these agendas is important in view of the strength of other automotive interests within the EU.

BUILD CONFIDENCE FOR THE LOW CARBON FUELS SECTOR

Low carbon fuels, in particular biofuels, currently do not benefit from the same clarity of outlook that automotive players enjoy thanks to the Automotive Council and LowCVP roadmaps. A partnership between government and stakeholders, ideally with an EU perspective, to define the long term outlook for fuels would be valued by the fuels and vehicles industries. This should build on the recently published LowCVP Fuels Roadmap.



Outlook

This report identifies many things that have gone right, as well as some that have gone wrong. However, it is not a manifesto for complacency as the journey has really only just begun.

The challenges of decarbonising road transport are enormous, especially as the UK seeks to capture a growing share of the industrial opportunities that this presents. Much work is still required to develop low carbon vehicles, fuels and technologies, and especially to manufacture them in the UK and deliver them to market. Government and industry, along with other stakeholders, through collaboration have made an important start on the journey.

Continuing dialogue, support and action is required to ensure that UK industry can deliver upon future targets and build both a vibrant and sustainable industry and vehicle fleet.



“Investment decisions are always about more than incentives – policy and stability are vital.”

MAJOR VEHICLE MANUFACTURER

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The authors are very grateful for the contributions provided by the many individuals who participated in the call for evidence and those who agreed to be interviewed during the course of this study. Their contributions have been invaluable in informing this work. A list of the organisations contacted may be found in the full report (Appendix 2).

The LowCVP would like to thank the Department for Business, Innovation and Skills and Greener Journeys for their support in this project.

Low Carbon Vehicle Partnership

The LowCVP, which was established in 2003, is a public–private partnership working to accelerate a sustainable shift to lower carbon vehicles and fuels and create opportunities for UK business.

Around 170 organisations are engaged from diverse backgrounds including automotive and fuel supply chains, vehicle users, academics, environment groups and others. The Partnership became a not-for-profit company limited by guarantee in April 2009.

The LowCVP plays a key role in helping Government to deliver its low carbon transport strategy. The objective of the strategy is to ensure that the UK takes a leading role in the global shift towards low carbon transport.

The Partnership’s work is coordinated by a permanent Secretariat headed by the LowCVP Managing Director, Andy Eastlake.





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