

BWG-P-06-13

Response to Review of the Powering Future Vehicles Strategy

1 Executive summary

The Powering Future Vehicles (PFV) Strategy was launched in 2002 with the objectives:

- For the UK to lead the global shift to clean, low-carbon transport.
- To promote the development, introduction and take-up of new vehicle technologies and fuels.
- To ensure the full involvement of the UK automotive industry in the new technologies.

This review by the Low Carbon Vehicle Partnership (LowCVP) has been undertaken at the request of the Department for Transport and follows extensive discussion throughout the Partnership's diverse membership.

The LowCVP fully supports the objectives of the current Strategy which it believes are appropriate and necessary for the UK to reduce the impact of road transport on climate change and secure long-term competitive advantage in vehicle design, development and manufacture. However, LowCVP does not believe the objectives are currently being achieved and potential benefits have not therefore been realised. For the Strategy objectives to be delivered requires Government, industry and wider society to work in partnership to deliver the necessary market transformation. Specifically, four issues must be addressed:

1. Further support should be provided for research, development and demonstration to ensure the UK remains a centre for technological development and product development of low carbon vehicles and components.
2. Effective incentives are needed to encourage manufacturers to bring to market low carbon models, and to stimulate the market for low carbon fuels. With respect to low carbon fuels the Renewable Transport Fuels Obligation (RTFO) is a fundamental policy tool, but the need for additional incentives should be examined, taking account of sustainability issues.
3. The framework for vehicle taxation needs to be amended to stimulate a self-sustaining market for low carbon vehicles.
4. An effective communications campaign should inform the public about the contribution of car use to climate change and the options, and benefits to motorists, of reducing emissions.

Members of the LowCVP recognise its responsibilities and urge the Government to match this commitment.

The report outlines technical, economic and institutional barriers to accelerate market transformation at each step of the market transformation process (Technology

Development, Product Development, Market Opening and Sustainable Market Growth). LowCVP believes sustained market transformation requires *all* significant barriers be addressed – a weakness of the current Strategy. Specifically the Partnership proposes that:

- **To encourage research, development and demonstration of low carbon vehicles in the UK:**
 1. The DTI's Innovation Platform approach is extended to low carbon vehicles at the earliest stage including a new call for collaborative R&D.
 2. The Government makes representations to the EU to streamline the process of obtaining state aid approval for schemes targeted at environmental improvement.
 3. A programme is established to provide grant support for proof of concept and small fleet trials of low carbon vehicles undertaken in the UK.
 4. Greater use should be made of the Forward Commitment strategy¹ to stimulate both public and private procurement of low carbon vehicles
 5. Funding is provided for the programme of testing, proposed by LowCVP, to examine how light and heavy commercial vehicles can be incorporated into the Strategy.
- **To support the introduction of low carbon buses in the UK:**
 6. By 2009, a national demonstration of 100 low carbon buses is undertaken to prove the reliability and maintainability of these new technologies for a UK audience.
 7. A review of low carbon bus demonstrations worldwide is conducted and disseminated to bus market stakeholders.
 8. Either through reform of BSOG, or the provision of capital grant support for low carbon buses, a market is created for these technologies.
 9. Local authorities should be empowered to act on climate change within their transport policy and planning powers.
- **To stimulate the market for low carbon vehicles**
 10. The DfT should finalise and commence its Climate Change Communication Strategy.
 11. The Government should encourage the purchase of low carbon vehicles by public bodies.
 12. The framework for transport taxation should be amended to provide meaningful incentives for purchasers of low carbon vehicles and fuels.
 13. The RTFO is a fundamental policy tool to encourage bio-fuels but the need for additional incentives should be examined, taking account of sustainability issues.

There is also a consensus that the current target for low carbon cars is neither appropriate nor achievable. Instead we propose 3 complementary measures:

- A sales weighted average of new car sales
- A proportion of total vehicle sales less than 120 g/km carbon dioxide at the tailpipe.
- A proportion of vehicle sales below 100g/km (measured on a well-to-wheel basis) to be met in 2020 to indicate the long-term direction of policy.

¹ Forward Commitment relates to the procurement of innovation defined by the Environmental Industries Advisory Group, Defra

Target levels and years would be established once policies had been finalised (including the successor arrangements to the current voluntary agreement).

For buses LowCVP proposes the current target of 600 low carbon bus sales by 2012 is retained; but, an interim milestone is established that - 100 or more low carbon buses demonstrated in the UK by 2009. In addition the Partnership proposes establishing a long-term target to encourage investment and development and operation of low carbon buses measured on a well-to-wheel basis.

Finally, it is proposed the scope of the Strategy be extended to encompass the role of fuels in delivering low carbon vehicles and technology based measures that support the use vehicles in an environmentally sustainable way.

2 Introduction

This paper describes the outcomes of a review of the Powering Future Vehicles (PFV) Strategy by the Low Carbon Vehicle Partnership (LowCVP). The Strategy describes the approach by which the UK Government proposes to *lead the global shift to clean, low-carbon transport*. The review was initiated by the Department for Transport (DfT) as a commitment in the original Strategy that was published in July 2002.

2.1 The Low Carbon Vehicle Partnership

The LowCVP was established in 2003, as an outcome of the PFV Strategy, to accelerate the shift to low carbon vehicles and fuels in the UK. It aims to help deliver carbon reduction targets and give commercial advantage to UK business. The Partnership is a multi-stakeholder forum with over 225 members including many leading car manufacturers and fuel suppliers, major fleet operators, environmental and consumer groups, academics and government departments.

The Partnership undertakes activities to both encourage the supply and raise demand for low carbon vehicles and fuels. This includes providing guidance on the priorities to stimulate market development. Some of our recent key achievements and principal current activities include:

- Brokering a voluntary agreement with the UK motor industry to introduce colour-coded fuel economy labels in all new car showrooms. On-going studies are evaluating the effectiveness of the label through research into dealer and consumer attitudes and implementation rates.
- Input to the development of the Renewable Transport Fuels Obligation – focussed on the development of sustainability assurance and carbon certification.
- Oversight of the establishment of Cenex, a public-private centre of excellence for low carbon and fuel cell technologies. The LowCVP is now represented on the Board of the company.
- The LowCVP Road Transport Challenge, a process initiated by the Partnership to bring forward innovative proposals for delivering carbon

reductions from the road transport sector. The best entries were presented at a conference in June '06.

This response has been prepared following extensive discussion throughout the Partnership and reflects the consensus view across the diverse membership.

3 Progress to date

3.1 Objectives

The Powering Future Vehicles Strategy states the Government's objective for the UK to *lead the global shift to clean, low-carbon transport*; and to:

- Promote the development, introduction and take-up of new vehicle technologies and fuels.
- Ensure the full involvement of the UK automotive industry in the new technologies.

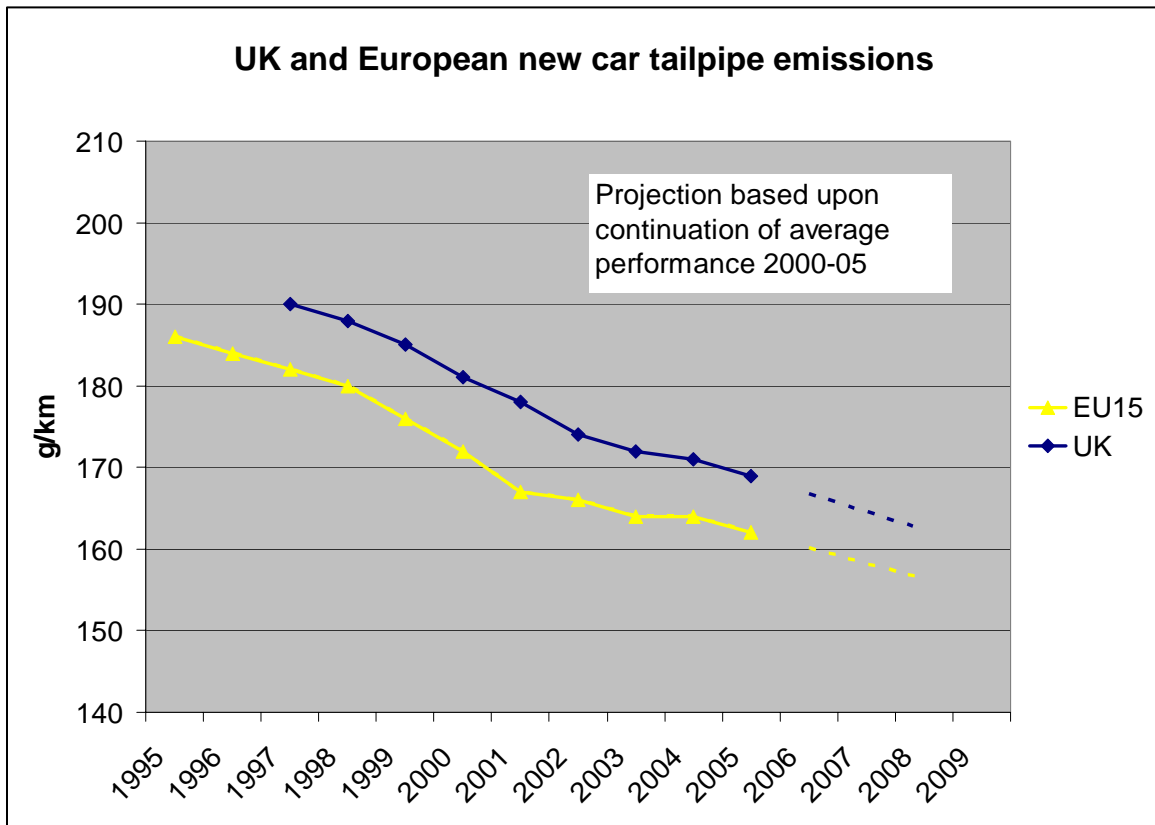
The LowCVP fully supports these objectives that, if delivered, will both reduce the contribution of road transport to climate change and secure long term competitive advantage for UK companies in vehicle and powertrain design, development and manufacture.

However, it has to be recognised that most of the UK automotive industry represents multinational companies which design vehicles for European and other worldwide markets rather than for specific UK conditions.

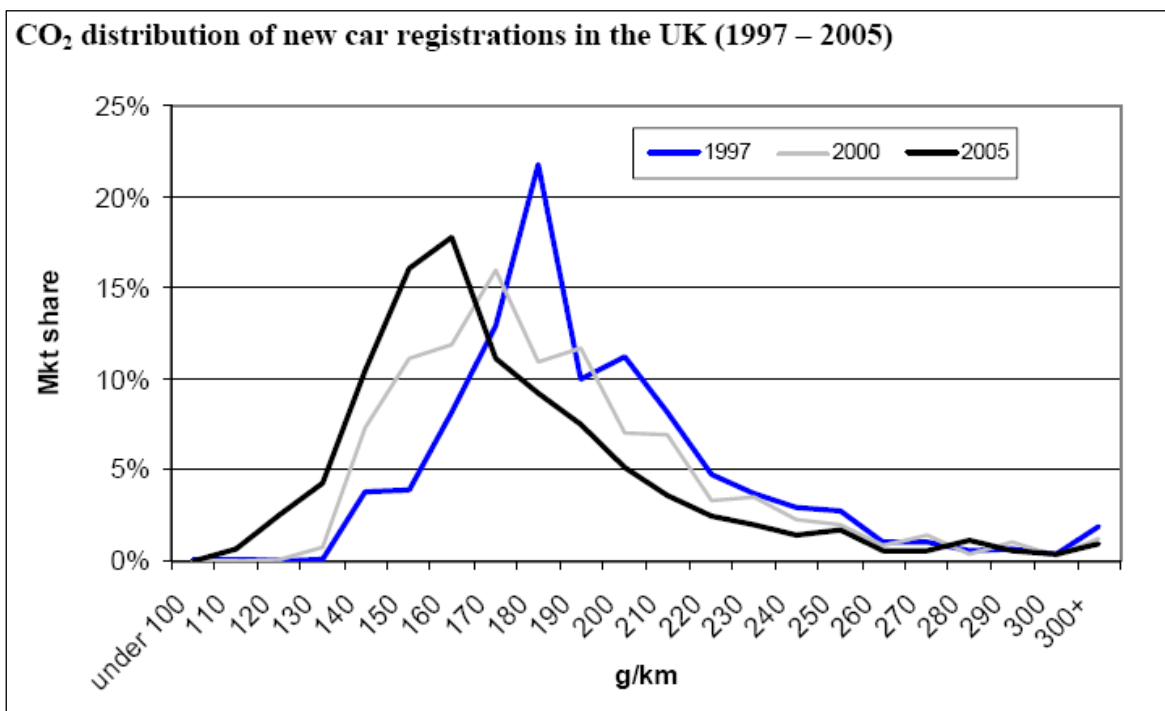
3.2 Progress against objectives

The LowCVP does not believe the objective of the UK leading the global shift to low carbon vehicles is currently being achieved. The potential benefits for carbon reduction and business competitiveness are not therefore being realised.

Although the motor industry and Government have made some progress in increasing supply and stimulating demand for more fuel efficient cars, UK sales weighted tailpipe carbon dioxide emissions for new cars remain the fourth highest in Europe (169g/km in 2005). There are five other European countries achieving a faster rate of reduction currently than the UK. Progress to date indicates the current PFV Strategy and policies will not deliver the global leadership that is desired.



Source: T&E



Source: SMMT

The EU Biofuels Directive requires Member States to set indicative targets for biofuels sales in 2005 and 2010 against 'reference values' of 2% and 5.75% respectively based on energy content. To date the UK has relied upon fiscal incentives through fuel duty to pump prime the market for biofuels, which has led to these fuels holding a market share of 0.25%. In order to comply with the Directive

the UK Government has announced that it will introduce a Renewable Transport Fuels Obligation (RTFO) in 2008 obligating fuel suppliers to sell 5% of their total road transport fuel sales by volume as biofuels.

If the UK is to lead the global shift to low carbon vehicles and fuels then significantly more robust measures need to be implemented than have been deployed since the introduction of the Strategy.

3.3 Progress against the action plan

The PFV Strategy sets out an action plan in ten areas and a detailed analysis of achievements against plan is set out in Appendix 1. In summary, progress against the action plan published in the PFV Strategy is mixed and in some cases has deviated from the plan considerably.

Summary of progress against PFV Strategy action plan

PFV Action Plan Areas	Progress
1. Targets	Minimal
2. Engage closely with stakeholders by establishing the LowCVP	Successfully established
3. Promoting research, development and demonstration through various programmes	Successful but constrained by budget
4. Encouraging consumer take-up of low carbon vehicles	Minimal to date. Currently developing communications campaign.
5. Support the provision of new refuelling infrastructure	Continuing on limited budget
6. Transport taxation move towards carbon dioxide basis and encouraging biofuels	Delivered but weak on private car buyer
7. European & international actions: standards & testing procedures	On-going
8. Health & safety matters	On-going
9. Trials to investigate how transport schemes could be incorporated into UK emission trading scheme	Scrapped due to introduction of EU ETS. UK proposal to include in EU ETS.
10. Greening of the Government's fleet	Lacks clear leadership

Two key areas where the action has deviated from the plan are encouraging consumer take-up of low carbon vehicles and trials of transport within a UK emission trading scheme, sections 2.4 and 2.9 respectively in the Powering Future Vehicles strategy.

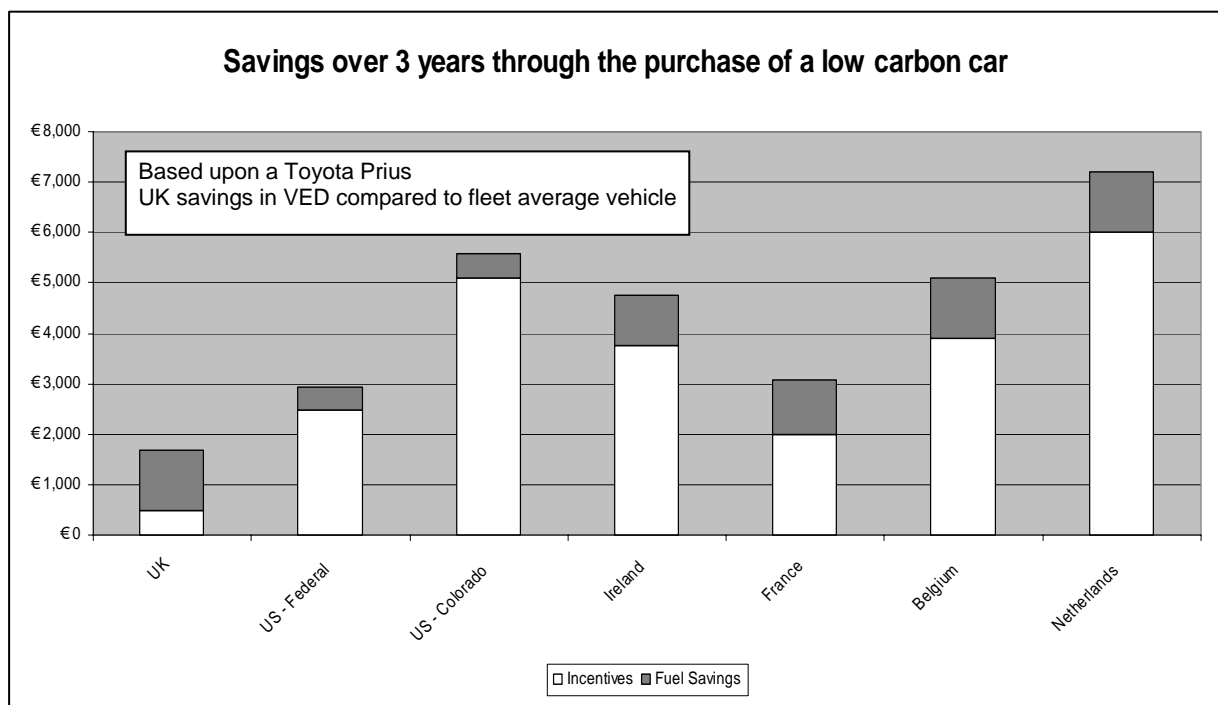
The intention of Section 2.9 of the PFV strategy, to undertake trials to investigate how transport could work within a UK emissions trading scheme, has been overtaken by the introduction of the EU emissions trading scheme. The UK Government has written to the EC proposing that surface transport should in the future be included in the EU ETS. LowCVP is planning work in this area to consider how best this might be achieved.

Section 2.9 in the PFV strategy states "Government will encourage consumer take-up of low carbon vehicles and fuels, through appropriate financial measures, and overcoming market barriers." It also sets out the following actions to:

- Continue Powershift type grants.

- Provide consumers with authoritative information on new vehicles and fuels.
- Work with industry and financial service providers on innovative means of owning/using vehicles.
- Encourage other appropriate measures which will support the up-take of cleaner vehicles e.g. exemption from Congestion Charge.

These actions have not been followed through, although a voluntary labelling scheme for new cars has been introduced by the motor industry and a communications plan for purchase of low carbon cars and to encourage eco-driving is intended. Other countries offer stronger incentives for low carbon cars than are available in the UK. For example, the graph below illustrates the encouragement provided to purchasers of one form of low carbon car technology, hybrids, in various countries. Whilst a range of approaches have been taken internationally, any future UK incentive programmes should be technology neutral in order to avoid unfair market distortions.



Source : EST, LowCVP

In the case of buses the regulatory framework and the manner of central Government support acts as a disincentive to adopt low carbon buses. The proposed Low Carbon Bus Programme designed to encourage bus operators to invest in low carbon bus technologies has however been scrapped.

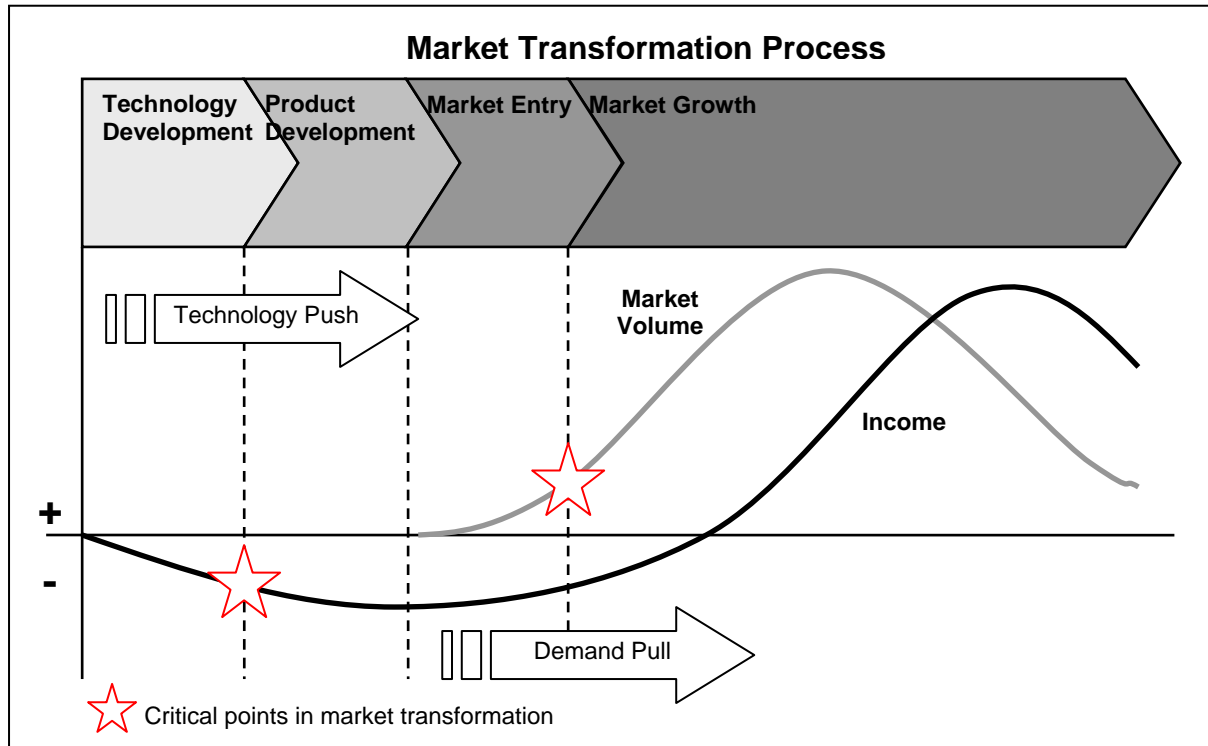
Furthermore, the suspension and final withdrawal of the EST's low carbon vehicle grant programmes has caused a loss of confidence within the market.

The motor industry has lost confidence that Government will consistently implement policies to encourage either supply or demand for low carbon vehicles. Confidence must be rebuilt for the UK to achieve the Strategy objectives.

Government incentives to support the adoption of low carbon vehicles are out of step with the objectives of the Strategy and need to be realigned.

4 Accelerating the shift to low carbon vehicles

The LowCVP believes the process of market transformation in favour of low carbon vehicles to be similar to other technologies or products that are more efficient (with lower running costs) but have a higher initial capital cost.



Source: Derived from EST, 2006

The key stages in the process are well understood:

- Technology development
- Product development
- Market opening
- Growing a sustainable market

Whilst the proposed model is highly simplified it nevertheless provides an effective framework to highlight the roles of Government, industry and wider society and the support needed at each stage of the process to achieve a timely, and sustainable outcome.

For low carbon vehicles there are two principal hurdles (critical points) in the market transformation process:

- Transition from technology development to product development - at which stage the level of investment required increases significantly.

- The boundary between market entry and market growth - where the market fails to attract demand beyond the early adopters. This is especially the case where a product requires a change in behaviour of the user, for example slow charging for electric vehicles.

The sections below describe current issues in transforming the UK market in favour of low carbon transport. A combination of technical, economic and institutional barriers exists to impede market transformation in the various vehicle markets. It is generally necessary to address *all* significant barriers to achieve sustained market growth. A failure in one link in the market transformation process will greatly diminish the impact of other measures.

The LowCVP recommends that a suite of policy instruments should be used, as appropriate, in a coordinated and coherent package of measures to accelerate the shift to low carbon vehicles in the UK across the market transformation process.

The LowCVP sees a key aspect of its role as reviewing and providing advice on the various programmes and schemes run by Government to support market transformation; and to highlight policy gaps and help ensure a coherent suite of interventions to accelerate the shift to low carbon vehicles in the UK.

4.1 Technology Development

This involves research and development to take an initial concept and develop it to a level where proof of concept can be demonstrated. This is typically undertaken through partnership between academia and industrial partners.

While this activity is relatively low risk (in terms of potential adverse outcomes) it nevertheless represents a considerable cost to industry. Investment in R&D is susceptible to the economic cycle and particularly challenging for smaller organisations. In the UK, Government support for technology development is principally provided through grant support for collaborative R&D - the majority of which is administered through the research councils (mainly the Engineering and Physical Sciences Research Council, EPSRC) and the DTI Technology Programme through competitive research calls. This is directed at pre-competitive research and development combining academic institutions as well as industry. In addition, the Foresight Vehicle, in its role as a knowledge transfer body for the automotive industry, has been instrumental helping drive forward research and development in order to keep the UK at the forefront of advances in technology.

LowCVP is concerned that investment in technology by UK Government is lagging behind that in other major centers of automotive manufacturing and research. For example: this year both the French and German Governments have announced major programmes to fund research and development in the area of low carbon vehicles. The French have announced €100m in support of the development of a sub 100g/km family car funded through taxation on higher emitting cars. While the German Federal Government has announced funding of €500m into hydrogen fuel cell vehicles over the next decade. The LowCVP believes that the establishment of a low carbon transport innovation platform would assist in ensuring the UK continues to invest in this strategic area where the UK currently has competence.

It is vital that the UK retains its position as a leader in design engineering if it is to benefit from the shift to low carbon vehicles. The design engineering sector of the automotive industry in the UK is an important source of income generation, with turnover of £1bn per annum and investment in technology development can provide significant returns for the UK. An example of the value to UK plc of encouraging low carbon vehicle development in the UK is provided by case study 1 in appendix 2. A £700,000 government funded contract directly secured £2.5m of work in the UK and led to an estimated further £20m of orders in addition to developing UK expertise in diesel emissions control.

Knowledge Transfer Networks (KTN) (that bring together industry, universities, research and technology organisations and financial institutions to share knowledge and increase innovation) are a useful mechanism to support market transformation.

LowCVP welcomes the establishment of the Low Carbon and Fuel Cell KTN being operated by CENEX and the opportunity to contribute to this initiative. LowCVP also support the proposed Low Carbon Transport Innovation Platform being developed by the DTI and would be pleased to contribute to this.

The LowCVP recommends that the innovation platform approach be extended to low carbon vehicles at the earliest stage. Also, that demonstration of proof of concept for a range of low carbon vehicle technologies (particularly for buses, but also for other vehicles) should be a priority in future R&D calls for environmental friendly vehicles.

4.2 Product Development

The Product Development stage involves further development and demonstration to optimise technology/product performance. During this stage the technology/product is taken through product feasibility, concept, prototyping and validation processes. The final stages are typically undertaken through close collaboration between vehicle operators and suppliers, allowing data to be obtained on reliability and maintainability. Dissemination of information to investors and the general public in preparation for market opening is common.

Commencing product development is high risk for OEMs. The scale of investment, is considerable whilst the prospects of return on investment remain uncertain. Once the product is exposed to vehicle operators, there is the added risk of an adverse impact on company reputation if the product performs poorly.

Despite the high risk of failure at this stage there is little support provided by the UK Government to encourage industry to undertake this work in the UK. This limits the opportunity for UK businesses to be exposed to new innovations in low carbon technologies. The LowCVP welcomes the establishment of the DTI's HFCCAT (Hydrogen, Fuel Cells and Carbon Abatement Technologies) Demonstration Programme which will assist in this area for fuel cells. The LowCVP believes this should be built upon in order to allow the UK automotive businesses to participate in demonstrating other technologies and so obtain important experience and expertise.

Case study 2, in appendix 2, provides an indication of the benefit that would accrue to the UK from supporting product development in the UK. Alexander Dennis led a consortium to develop a hybrid bus with a zero emission operating capability. £0.69m of Government funding secured a project valued at £1.38m, employing staff equivalent to 17 man years and which will deliver competitive advantage to UK manufacturing in the domestic and export markets for buses. However, this valuable expertise is currently frustrated in the domestic bus market due to Government policy on buses.

Whilst EU state aid legislation limits the support Member States can provide as an innovative product nears commercial exploitation the Partnership believes the UK Government does not take sufficient advantage of the support/incentives it could provide. The LowCVP believes that the DfT could take a more robust stance regarding state aid approval and should seek improvements from the EU in the handling of state aid applications. While the LowCVP welcomes the limited support for proof of concept and small fleet trials of low carbon vehicles through the EST R&D programme and Cenex's activities, the LowCVP believes there should be additional support for demonstration and in particular support for larger field trials building on the existing activity in this area.

Specifically LowCVP believes the Government could support/incentivise product development through:

- Grant support for small fleet demonstration typically 10-30 vehicles
- Grant support for field trials, potentially 100-200 vehicles
- Legislative requirements which would need to be introduced at an EU level to be effective
- Tax incentives and allowances against mainstream taxation
- Dissemination of information, market education
- Support brokering introductions between companies seeking inward investment and the financial community.

The Partnership believes it would be beneficial to develop targets for development of low carbon vehicle technology to 2020. This would provide a signal of long term policy and encourage investment in low carbon vehicles. The target should be met by providing targeted support for different vehicle types :

- Low Carbon Cars
 - Provide grant funding for proof of concept and small, limited volume, fleet trials.
- Low Carbon Buses
 - Reinstate the proposed Low Carbon Bus Programme (or an equivalent form of support)
 - Undertake a widespread demonstration of 100 low carbon buses to prove reliability and maintainability.
 - Undertake a review of low carbon bus demonstrations worldwide, comprising a research study the results from which will be disseminated via seminar to bus market stakeholders to be organised by DTI.

- Low Carbon Commercial Vehicles
 - Develop a basis for defining low carbon commercial vehicles.
 - Provide grant funding for proof of concept and small fleet trials.

The Partnership also believes that the EU could facilitate further investment by OEMs by:

- Streamlining the process of getting state aid approval
- Providing a searchable database of Member State schemes which have received approval
- Providing better guidance on areas where Member States should act, such as climate change, and in the role of road transport

4.3 Market opening

Market entry of low carbon vehicles is initially targeted at innovators that account for about 2.5% of total market share and have both a strong aptitude and need for the technology. At this stage in the market transformation low carbon vehicles usually have a significantly higher capital cost which is off set by lower operating costs due to better efficiency. Purchase costs are also inflated by the need to recoup a proportion of the R&D costs on a relatively low volume of sales since long term sales volumes remain uncertain.

The form of support available at market opening is constrained by EU State Aid rules. However, targeted support to kick-start the market is permissible and necessary such as through:

- Capital grant support for low carbon buses which offer significant environmental benefits; but do not provide a payback in a reasonable period of time
- Tax incentives and allowances
- The use of procurement policy to provide demand pull
- Communication campaigns
- Assistance in removing non-fiscal market entry barriers – such as for refuelling

Incentives should be based upon a vehicles environmental performance and not technology. LowCVP does not support the long-term use of subsidies or consider that necessarily all innovators and early adopters need to benefit from subsidies.

The LowCVP is disappointed the Government has chosen not to go ahead with grant support programmes which could have made an important contribution to this stage of the market transformation if targeted appropriately. The DfT decision was based upon the poor cost effectiveness of proposed grant programmes. A critical factor in arriving at this conclusion was the assertion that because the market transformation effects would be difficult to quantify that they should be ignored. This is an inappropriate assertion and biases the results when compared to other measures within the Climate Change Programme Review. The LowCVP strongly urges the DfT to incorporate market transformation impacts in assessing the low carbon bus and car programmes to provide a true and fair assessment of cost effectiveness.

Support is particularly needed to address the obstacle to the introduction of low carbon buses created by the operation of the Bus Service Operators Grant (BSOG). BSOG operates by supporting the operating cost of buses on public service routes, rather than the capital or any other costs involved in providing the service. BSOG provides a rebate of 80% of fuel duty paid and means the benefits of low carbon technologies in terms of reduced operating costs do not compensate for the higher capital cost of the bus.

An important innovator for low carbon vehicles should be the public sector, including the Government's own fleet of vehicles. Preferential procurement of the lowest carbon vehicles should be used to create a demand pull. It will also help to demonstrate the credibility and market readiness of new technology to early adopters. The use of a Forward Commitment strategy, as proposed by the Environmental Innovations Advisory Group (EIAG) and being developed by Cenex, should be actively encouraged and supported.

Company car taxation also has an important role to play in opening the market for low carbon vehicles and fuels, by stimulating demand from the private sector company car fleet. To maximise this impact, company car taxation needs to take account of the carbon dioxide impact of the fuel in addition to tailpipe carbon dioxide emissions of company cars..

Case study 3 in appendix 2 provides an indication of the benefit that accrues to the UK from supporting market opening in the UK. Government incentives for the introduction of LPG vehicles during the 1990s led to Vauxhall introducing them in 1998. This decision secured in excess of £5m inward investment in the UK, allowed for employment of 50 staff directly and another 20-30 indirectly, as approximately 50% of components were locally sourced. The intellectual property (IP) developed is owned in the UK and could still lead to export sales.

LowCVP encourages the Government to examine a range of policy options to support the market entry of low carbon vehicles including for:

- Low carbon cars
 - To actively encourage procurement of the best available low carbon technologies by the public sector
- Low carbon buses
 - Obtain a similar level of grant support for low carbon buses, independent of fuel type or drive-line technology, as provided by BSOG for diesel buses. This could be provided as an amendment to BSOG, but remain within current the ceiling of support BSOG could be expected to provide over the life of the bus. Alternatively, a supplementary capital grant could be provided by reinstating the Low Carbon Bus Programme.
 - Initiate a public procurement plan, working together with other interested European countries, to replace all buses currently used in park and ride schemes with low carbon buses: the additional cost to be funded by local revenues and DfT's Local Transport Plan settlements.
- Low carbon commercial vehicles

- Develop an Enhanced Capital Allowances (ECA) scheme for commercial vehicles, and potentially services which reduce fleet carbon emissions, achieving a low carbon standard.

4.4 Growing a sustainable market

To create the market conditions to move beyond the first innovators and attract early adopters into the market (a market share of between 2.5% and 13.5%) requires:

- Government to create the appropriate market conditions for growth
- Non-fiscal barriers to market growth to be addressed
- Suppliers need to focus on product completeness from the point of view of the user (including servicing and maintenance, refuelling, insurance, parts availability and residual values).

There are many examples of markets for new technologies in which innovators have been the only adopters – for example Autogas. Even robust products/technologies can fail at this stage if the product requires the user to change their behaviour. For example, the bus market's response to CNG buses has been weak. This is in part due to the higher capital cost of CNG buses and the inadequate payback as a result of the operation of the BSOG. In addition the longer refuelling times compared to diesel buses presented considerable problems. This would have required a change in the washing, refuelling and parking of buses in most depots at the end of each day which was difficult to accommodate. Another example is the impact of forecast residual values and warranty issues for vehicles converted to LPG.

In growing market share for low carbon cars the key barrier is to address the low priority currently given to environmental issues and fuel economy by most new car buyers. Elements to the solution will include:

- Consumer education campaigns – including raising awareness of fuel economy through labelling
- Enhancing the desirability of low carbon vehicles through effective advertising and promotion
- Expanding the choice of vehicles available in all segments of the market
- Strengthening incentives for users of low carbon cars and fuels

A key issue is to ensure an appropriate, long-term fiscal environment to encourage sustained market penetration. Without this there is little incentive to encourage the automotive supply chain to invest in developing low carbon technologies.

At present there is incomplete consensus on the optimum policy measures that will support a sustainable market for low carbon vehicles. It is agreed however, that the following principles should form the basis for market incentives.

- Predictable and consistent – to build confidence in Government policy
- Not prescriptive – outcome based
- Technology neutral - Performance related
- Avoiding market distortions – no sharp boundary conditions

- Consistent with the EU policy framework and compatible with global market requirements
- Holistic – avoiding policy clashes
- Based upon sound impact assessment
- Regular policy assessment undertaken
- Stakeholder input at early stage
- Balanced package of incentives and penalties
- Partnership approach – Govt policy to support industry agreements
- Long term and consistent across all government departments and devolved administrations, including local authorities.

Specific measures that are supported by most LowCVP members include:

- Further use of tax incentives and allowances (such as Enhanced Capital Allowances) to encourage the purchase of low carbon vehicles and fuels
- Public engagement and awareness campaigns on both climate change and options to reduce road transport emissions
- Empowering local authorities to act on climate change within their transport policy and planning powers
- Increase bus patronage by requiring councils to formulate and initiate integrated transport plans which include a strategy for the use of low carbon buses.
- The RTFO is a fundamental policy tool to encourage bio-fuels but the need for additional incentives should be examined, taking account of sustainability issues.

5 Targets

The Government set itself targets in the PFV Strategy “to provide strong signals to the market about Government priorities and the focus for fiscal measures and Government programmes.” In the original PFV Strategy two targets were established with a stated aspiration to develop three further targets.

The targets are:

- 10% of all new car sales to be 100 g/km CO₂ or less at tailpipe by 2012.
- 600 or more low carbon buses coming into operation per year by 2012.

Proposed additional targets were for:

- Sales of ultra-low carbon cars by 2020.
- Manufacturing and supply chains.
- Light commercial vehicles, as data becomes available.

The Powering Future Vehicles strategy did not call for a target in relation to heavy commercial vehicles on the basis that it was felt that the haulage industry was competitive and consequently very fuel efficient.

5.1 Low carbon car target

The low carbon car target was designed to supplement the motor industry’s voluntary agreement and reduce fleet average tailpipe carbon dioxide emissions by skewing the sales distribution towards the lowest carbon models. Section 3 described the

limited progress that has been made towards the current low carbon car target. This is because:

- No cars meeting this requirement are currently available for sale in the UK (excluding some electric vehicles).
- Only a few experimental vehicles have been demonstrated as technically capable of meeting this target, (e.g. Efficient-C). The cost of supplying these vehicles is currently considered prohibitive and there are no plans to commence production.
- Environmental concerns are a low priority for most car purchasers
- Whilst fuel economy is stated as an important issue in vehicle purchase decision there is good evidence most new car buyers fail to research or understand the relative efficiencies of different models

The target could be achieved by developing a micro car market in the UK - but these are unlikely to be viewed as substitutes for existing cars sold in the UK.

The consensus amongst LowCVP members is that the current target is neither appropriate nor achievable and that the target should be reframed. At present LowCVP members have not proposed specific target levels. This is because an appropriate target will depend upon future policy – particularly the successor arrangements to the current EU Voluntary Agreement. LowCVP would however propose the following forms of target be adopted:

- **A sales weighted average of new car sales.** This is the most effective approach to efficiently stimulate improvements, and would measure developments, across the full range of vehicles The UK should set an initial target to achieve the European target level by its compliance date. At present UK emissions are significantly above the EU average figure.
- A target for sales of vehicles emitting less than 120 g/km carbon dioxide at the tailpipe. This target would reflect a policy aim to inform and motivate car buyers to purchase the most efficient cars that are currently available. The target for the proportion of sales sub-120g/km would be established once a new suite of policy measures had been finalised. It would take the form of “20% of all new car sales to be 120 g/km CO₂ or less at tailpipe by 2012.”
- Retaining the form of the present target (a proportion of vehicle sales below 100g/km) but measured on a well-to-wheel basis. This target is designed to motivate future technology development and innovation and for the UK to lead the global transformation to low carbon vehicles. The target would be in the form of “XX% of all new car sales to be 100 g/km CO₂ or less measured on a source-to-wheel basis 2020”

LowCVP work to develop a carbon certification method for biofuels will provide a mechanism by which to calculate the relative carbon intensity of different fuels available on the UK market, on a source-to-wheel basis. Once a robust mechanism is in place for the majority of fuels the short to medium term targets should move to a source-to-wheel basis.

5.2 Low carbon bus target

LowCVP members believe the current low carbon bus target of 600 or more low carbon buses in operation annually by 2012 is entirely appropriate but will not be

achieved with current policy. Our recommendation is therefore to retain the target and develop an effective suite of policies. This is since, at present:

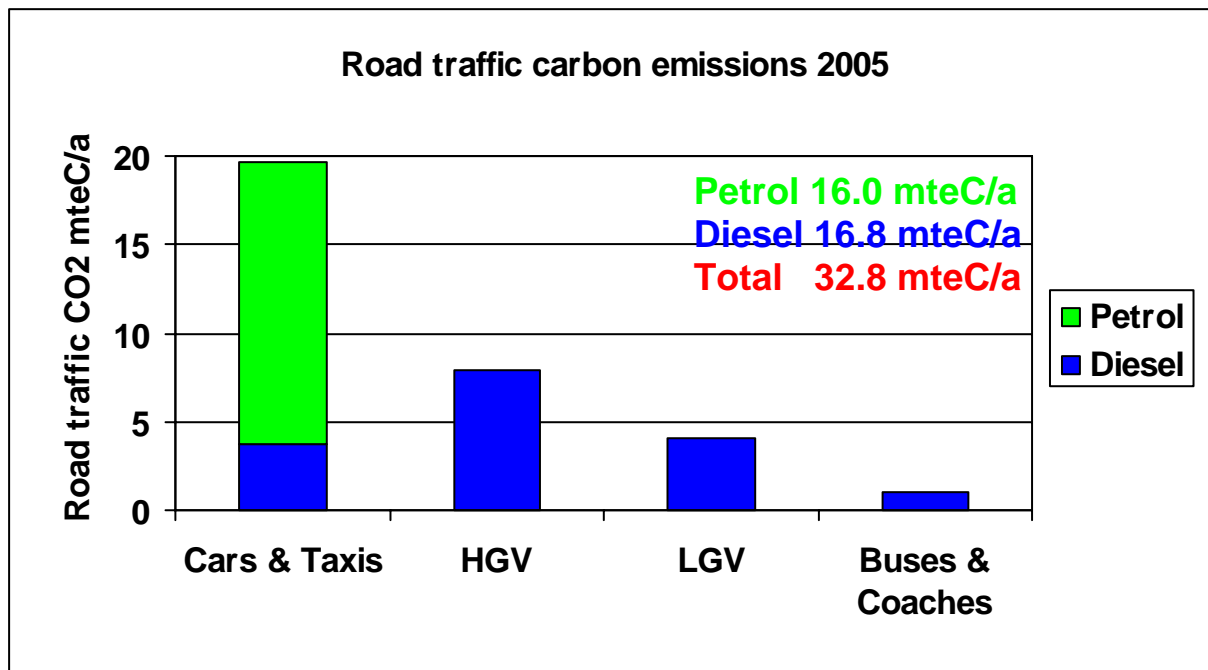
- Only four demonstrations of potentially low carbon buses are currently being undertaken in UK.
- Low carbon buses are unlikely to offer sufficient fuel savings to recover the initial additional capital cost while the majority fuel duty is rebated.
- The adoption of low carbon buses against a backdrop of falling bus patronage outside London, with some exceptions, is unlikely.
- The majority of bus services outside London are not tendered and those that are tendered are generally subsidized because they are not commercially viable.
- Local authorities do not have sufficient powers to encourage low carbon buses.
- BSOG provides less grant support for low carbon buses than for traditional diesel.
- The UK bus market lacks sufficient volume to secure the robust development of low carbon buses in isolation of the rest of Europe.
- Due to the difference in truck and bus duty cycles it is unlikely that buses will benefit from low carbon technology developed for the truck industry.
- The suspension and final withdrawal of the low carbon bus programme has caused a loss of confidence amongst bus manufacturers and suppliers and has undermined the business model for developing low carbon buses.

The LowCVP proposes that the current target is retained, and in addition an interim milestone established that -100 or more low carbon buses demonstrated in the UK by 2009.

LowCVP also proposes establishing a long-term target to encourage investment and development and development in the form of "X% of buses coming into operation per year by 2020 will be ultra low carbon buses." LowCVP could advise on the definition of an ultra-low carbon bus that would be based on a source-to-wheel measure.

5.3 Commercial vehicle targets

Thirty seven percent of carbon dioxide emissions from road transport, according to the DTI, come from commercial vehicles. Heavy commercial vehicles account for 24% and light commercial vehicles account for 13%. Buses and coaches by comparison account for only 3% of carbon dioxide emissions from road transport.



Source: DTI 2005

In light of this, both light and heavy commercial vehicles should come within the PFV Strategy and appropriate targets and policies developed to encourage reduced carbon dioxide emissions. The precise nature of these targets will be dependent on the definition of a low carbon commercial vehicle, which is currently being considered by the LowCVP's Commercial Vehicle and Passenger Car working groups (for light commercial vehicles).

The LowCVP believes that targets should be expressed as source-to-wheel and based upon greenhouse gases (GHG). The Partnership urges the Government to fund the testing work needed to enable development of the target to proceed.

5.4 Supply chain targets

The LowCVP proposes that two targets are established to measure the progress of the UK supply chain in supporting the transition to low carbon vehicles and fuels:

- An input target expressed in the form: "By 2012 product innovation in the automotive supply chain relating to low carbon vehicle and fuel technologies will be 10% points higher than the level in 2006." According to the DTI's Innovation survey 37% of respondents in the automotive industry were product innovators while only 25% of respondents were from UK industry as a whole.
- An output target expressed in the form: "By 2012 UK content of production for the most fuel efficient vehicles in each segment will be 5% points higher than the level in 2006."

6 Scope of the Powering Future Vehicles Strategy

The original Powering Future Vehicles Strategy failed to recognise the relevance of total road transport emissions being a function of efficiency, fuel and distance driven.

In considering the scope of the Powering Future Vehicle strategy the LowCVP took note of the recommendations of the Cars21 group which reported earlier this year. The Cars21 report focussed upon the need to deliver CO₂ savings from road transport through an Integrated Approach that encompasses measures from all stakeholders. Specifically:

- Increased market penetration of CO₂ efficient technologies
- Increased market penetration of alternative fuels
- Support for eco-driving
- Consumer information
- Improved road and traffic management infrastructure.

A number of the areas covered by the Integrated Approach are already addressed by the Powering Future Vehicles strategy. These focus on vehicle technologies, alternative fuels and consumer information. Improvements to road traffic management infrastructure are clearly beyond the scope of the strategy however, the LowCVP believe that the scope of the document should be extended to incorporate some further aspects of the Integrated Approach. These are fuel supply and technology based supporting measures for eco-driving.

The development of renewable fuels and their introduction into the fuel supply will have implications for carbon emissions which the Strategy does not take account of at the current time due to its focus on tailpipe carbon emissions. The Partnership notes the current discussion as to how to take account of E85 flex fuel vehicles, and the same issue applies to electric vehicles, which are zero emission at tailpipe but not over the life cycle of the fuel. In addition it is likely that there will be an increasing interdependency between what is achievable with advanced fuels and low emission vehicles.

The inclusion of technology-based supporting measures for eco-driving incorporates the interface between the vehicle and how it is used. This offers the potential for significant reductions in carbon emissions, at least as great as from fuels and vehicle efficiency and is currently not covered by the Strategy. This would include measures such as gearshift indicators, instantaneous and average fuel consumption, target fuel consumption for the journey programmed in to satellite navigation devices and other similar measures.

7 Conclusions

The LowCVP fully endorses the objectives of the Powering Future Vehicle Strategy:

- For the UK to lead the global shift to clean, low-carbon transport.
- To promote the development, introduction and take-up of new vehicle technologies and fuels.
- To ensure the full involvement of the UK automotive industry in the new technologies.

LowCVP feels these are appropriate and necessary for the UK to reduce the impact of road transport on climate change and secure long term competitive advantage in vehicle design, development and manufacture.

To achieve the shift to low carbon vehicles will require Government, industry and wider society working in partnership with joint ownership. Government must establish a policy framework in which industry stakeholders can develop and deliver the technologies needed for market transformation. If the UK is to lead the shift to low carbon vehicles, or even keep pace with the most dynamic states, new policies will be needed to stimulate demand for low carbon vehicles and targeted support provided to enable UK businesses to benefit from the transition. Members of the LowCVP recognise their responsibilities and urge the Government to match their commitment.

Progress towards the PFV Strategy objectives and targets has been limited. The objective to provide global leadership is clearly not being achieved given the relative performance in reducing carbon emissions in the UK compared to other EU15 member states. The LowCVP believes the target for low carbon cars remains inappropriate and unachievable, whilst the low carbon bus target is seen as appropriate but nevertheless still unachievable given current policy measures. The original action plan and planned measures in the PFV Strategy did not provide a holistic approach to support the targets and was not fully implemented.

To accelerate the shift to low carbon vehicles three issues must be addressed:

- Further support should be provided for research, development and demonstration to ensure the UK remains a centre for technological and product development.
- Effective incentives are provided to open the market to new low carbon models.
- The framework for vehicle and fuel taxation is amended to stimulate a self sustaining market for low carbon vehicles and fuels. With respect to fuels account should be taken of the RTFO and sustainability issues.

Specifically, LowCVP members propose that:

- **To encourage research, development and demonstration of low carbon vehicles in the UK:**
 1. The DTI's Innovation Platform approach is extended to low carbon vehicles at the earliest stage including a new call for collaborative R&D
 2. The Government make representations to the EU to streamline the process of obtaining state aid approval for schemes targeted at environmental improvement.
 3. A programme is established to provide grant support for proof of concept and fleet trials of low carbon vehicles undertaken in the UK.
 4. Greater use should be made of a Forward Commitment strategy to stimulate both public and private procurement of low carbon vehicles.
 5. Funding is provided for the programme of testing, proposed by LowCVP, to examine how light and heavy commercial vehicles can be incorporated into the Strategy.
- **To support the introduction of low carbon buses in the UK:**
 6. By 2009, a national demonstration of 100 low carbon buses is undertaken to prove the reliability and maintainability of these new technologies for a UK audience.
 7. A review of low carbon bus demonstrations worldwide is conducted and disseminated to bus market stakeholders.

8. Either through reform of BSOG, or the provision of capital grant support for low carbon buses, a market is created for these technologies .
9. Local authorities should be empowered to act on climate change within their transport policy and planning powers
- **To stimulate the market for low carbon vehicles**
 10. The DfT should finalise and commence its Climate Change Communication Strategy.
 11. The Government should encourage the purchase of low carbon vehicles by public bodies.
 12. The framework for transport taxation should be amended to provide meaningful incentives for purchasers of low carbon vehicles and fuels.
- **Targets within the PFV Strategy are modified such that:**
 13. The LowCVP resists the dilution of targets.
 14. The LowCVP believes that the car and bus target should be redefined to provide benchmarks to measure progress against short, medium and long term aims. The specific targets proposed are:
 - Low Carbon Cars
 - 20% of all new car sales to be 120 g/km CO₂ or less at tailpipe by 2012.
 - The sales weighted average tailpipe CO₂ for new car sales to be XXX g/km by 2012. (to be set inline with the replacement to the voluntary agreement)
 - XX% of all new car sales to be 100 g/km CO₂ or less measured on a source-to-wheel basis 2020
 - Low Carbon Buses
 - 100 or more low carbon buses demonstrated in the UK by 2009.
 - 600 or more low carbon buses coming into operation per year by 2012.
 - X% of buses coming into operation per year by 2020 will be ultra low carbon buses.
 15. Source-to-wheel calculations should be factored into the overall targets as and when a robust system of carbon certification for the majority of fuels has been established.
 16. Targets for the supply chain be developed, ideally based upon an input and an output measure.
 17. A definition for low carbon commercial vehicles is developed to be followed by policy objectives and targets.
 18. Targets should be expressed on a source-to-wheel basis and based upon greenhouse gases (GHG).
- **The scope of the PFV Strategy is extended to encompass:**
 19. The role of fuel in reducing greenhouse gas emissions from road transport.
 20. Environmentally friendly use of vehicles should also be incorporated.

The LowCVP will continue to review and provide constructive advice on the most effective means of delivering the PFV Strategy objectives. This will include highlighting policy gaps to help ensure a coherent suite of interventions to accelerate the shift to low carbon vehicles in the UK.

8 Appendix 1

2.1 Targets <i>The Government will set challenging targets for making the UK a world leader in the move to a low-carbon transport system, looking to the next decade and beyond.</i>		
Summary	Progress	Comment
Firm targets		
Firm targets were set for low carbon cars and buses to be achieved by 2012.	Slow progress against targets as they stand.	Targets should be redrafted in line with short, medium and long-term aims.
The targets were to be reviewed in 2005 by the LowCVP.	Targets reviewed early 2006.	Target levels should be developed as part of the Strategy finalisation and replacement of the EU Voluntary Agreement.
Aspirational targets		
The Strategy aspired to establish targets for low carbon light commercial vehicles, supply chain and ultra low carbon cars.	Supply chain target proposal complete. Definition of low carbon LCV being developed by LowCVP. Recommend low HCV target developed also.	DfT is encouraged to fund testing to enable targets for low carbon HCV and LCV to be developed.

2.2 Low Carbon Vehicle Partnership <i>The Government will work closely with all stakeholders from the automotive, energy and other sectors, establishing a forum to maximise the potential for the UK business to gain competitive advantage from the Powering Future Vehicles Strategy.</i>		
Summary	Progress	Comment
Establish LowCVP		
In line with Automotive Innovation and Growth Team recommendations.	Established January 2003.	Effectiveness constrained by availability of funds to support the work programme.
Encourage stakeholders		
Encourage stakeholders to engage proactively	To date 225 stakeholders have joined LowCVP.	Successful outcome.

Provide a forum		
For Government and stakeholders to liaise on upcoming policy and regulatory issues.	Liaison and co-operation on RTFO and environmental standards shows how LowCVP allows stakeholders and Govt to work together on a new policy.	Successful outcome
For stakeholders to work together to overcome barriers	LowCVP and car manufacturers' development of new car fuel economy label key example.	Successful outcome
Provide Government with independent input and feedback		
Ensure Govt RD&D programmes work effectively together	Limited role to date, although LowCVP is represented on EST's ETAC and Cenex's board.	Propose this is area of activity LowCVP has greater emphasis.
Monitor progress against targets	PFV review of targets first undertaken in 2006.	More regular feedback should be provided.

2.3 Research Development and Demonstration		
<i>Government will use its grant programmes to fund research development and demonstration projects and will review them regularly to ensure that they are properly focussed and working effectively together.</i>		
Summary	Progress	Comment
Foresight Vehicle		
This is the primary knowledge transfer body for the automotive industry and has been a vehicle for distributing Government grant support to R&D projects.	Over 400 projects have benefited from Foresight Vehicle. Although its grant distributing role has been successfully completed it continues to be a vital element in the Fuel Cell and Low Carbon Vehicle, and Advanced Materials KTNs.	Provided excellent road mapping of technologies to direct R&D funding.
New Vehicle Technology		
This is to support the pilot demonstration and introduction of low carbon vehicle technologies. It is administered by EST as part of its <i>Transport Energy</i>	One of two programmes for which EST has received state aid approval. Current budget £3m per annum.	Government support should be extended and move into demonstration phase, building on work of EST and Cenex.

programmes.		
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2.4 Encouraging Consumer Take-up of Low-Carbon vehicles		
<i>The Government will encourage consumer take-up of low-carbon vehicles and fuels, through appropriate financial measures, and overcoming market barriers.</i>		
Summary	Progress	Comment
Capital Grants		
Continue Powershift type grants for hybrids to support move to low-carbon vehicles, help offset higher costs while market for these is small	Powershift grants suspended in 2004 while state aid approval was sought from EU. DfT announced they did not intend to go ahead with replacement programme in June 2006.	Widespread concern that low carbon grant programme withdrawn. Reassess the opportunity for limited volume grants to support emerging technologies.
Consider grants for other new vehicles reaching market – taking account of long and short-term benefits in emissions reduction, air quality emissions and noise. Government will look to LowCVP for advice on future grants and the operation of existing schemes.	Low carbon car, low carbon bus and air quality programmes developed by EST. DfT decided not to go ahead with programmes in June 2006.	The proposed low carbon bus programme should be reinstated or an equivalent form of support provided.
Providing Information		
Provide consumers with info on availability, performance and safety of new vehicles and fuels incl. info on whole-life costs.	Provided through EST Transport Energy programmes to a limited extent.	More support is required for this area and should focus on influencing consumer behaviour. This will require on-going support.
Provide info on environmental performance of new vehicles and fuels.	Provided through EST Transport Energy programmes to a limited extent.	
Vehicle Ownership		
Work with industry and financial service providers to develop new ways in which vehicles can be bought, owned or leased.	Not taken forward.	

Supporting Measures		
Encourage other measures which will support consumer take-up of cleaner vehicles for example, Transport for London's decision that high quality alternatively fuelled vehicles will be exempt from the proposed London Congestion Charge Scheme.	Not taken forward. DfT took positive decision not to issue guidance on exemption from congestion charging schemes.	LowCVP developing position paper. Any supporting measures need to be clear and consistently applied, recognising international standards.

2.5 New Fuel Distribution Infrastructure		
<i>The Government will facilitate the quick and smooth development of new fuel distribution infrastructure as it is needed.</i>		
Summary	Progress	Comments
Developing refuelling infrastructure with stakeholders		
New vehicles and fuels may call for new fuel distribution infrastructure, and Government has an important job in facilitating its smooth and speedy development. The successful establishment of the LPG network across the UK is the type of contact which the LowCVP will facilitate.	Infrastructure grant programme provided grant support for new refuelling infrastructure via EST.	
Government is working to secure the development of the network of CNG outlets.	A limited number of strategically key natural gas refuelling stations were supported around the UK.	
Building Confidence		
Government, w/ vehicle manufacturers, fuel suppliers and local authorities, is to bring together interested potential users and suppliers of natural gas vehicles and fuel to build confidence in the natural gas market.	Not taken forward.	

Green Fuels Challenge		
Further ahead, Government is providing zero-duty financial support under the Green Fuels Challenge for demonstration pilots. These relate to hydrogen refuelling; use of biogas in landfill sites; use of methanol in dedicated vehicles.	Green Fuel Challenge was undertaken.	Proposals to promote green fuels should be developed with regard to RTFO.
A further round of the Green Fuels Challenge is currently (July 2002) in progress.		

2.6 Transport Taxation		
<i>The Government will support the move to a low carbon transport system by ensuring the appropriate taxation of vehicles, fuels and infrastructures.</i>		
Summary	Progress	Comments
Vehicle Excise Duty		
Intro of graduated system of VED for cars based on carbon dioxide emission levels.	Introduced	VED differentials should be strengthened to provide private motorists with greater incentive and should take account of the impact of the fuel on CO2 emissions.
Budget 2002 announced low-carbon car VED band for vehicles – increasing the differential between the cleanest and most polluting vehicles to £100 p.a.	Extended with the introduction of a G band and A band given zero cost in 2006 Budget.	
Company Car Taxation		
Intro of company car taxation based on CO2 emission levels	Introduced	CO2 from company cars reducing faster than for private cars. Company car taxation needs to take account of CO2 impact of fuel supply.
Fuel Duty		
The favourable fuel duty differentials for	Introduced	Develop in light of the bio-fuel market..

road fuel gases and biodiesel		
Budget 2002 announced fuel duty exemption for H2 in the future for a limited period to encourage its further development as a road fuel.	Introduced	
Budget 2002 announced commitment to intro fuel duty incentives favouring sulphur free fuels from 2003.	The oil industry has invested £600 million in adapting UK oil refineries to produce sulphur free petrol and diesel which will enable the introduction of more fuel efficient technology such as gasoline direct injection.	
Green Fuel Challenge		
The Green Fuel Challenge pilot projects	Introduced	
Budget 2002 announced second round of Green Fuel Challenge.		
Enhanced Capital Allowances		
Budget 2002 announced Enhanced Capital Allowances under Green Technology Challenge for companies buying most efficient cars, investments in CNG and H2 fuelling infrastructure.	Introduced	Extend to low carbon commercial vehicles.
Government will continue to keep taxation under review, look at other taxation policy avenues available.		

2.7 European And International Actions; Standards and Testing Procedures

Government will work proactively with its EU and other partners in the international aspects of securing the development, introduction and take-up of new vehicles and fuels. Government will ensure that appropriate standards and testing procedures are put in place for new vehicles, fuels, and fuel distribution infrastructure.

Summary	Progress	Comments
European Type Approval		

European type approval allows new technologies to be considered on their merits. The UK Government will promote applications from industry that seek to take advantage of these special arrangements.	Development of standards for hydrogen vehicles.	
Development of Appropriate Standards		
The Government is involved in these organisations (International Energy Authority (IEA), UNECE, OECD and WTO) working for appropriate standards, common environ. goals etc.	On going	
Key Issues to be tackled internationally:		
Negotiations with EU and European, Japanese and Korean car manufacturers on next steps on CO2 emissions	Mini consultation on replacement to voluntary agreement.	
Development of EU Emission standards		
International protocol for measuring tailpipe emissions of hybrids	On going	
Lifecycle methodology.	<i>Not aware of progress</i>	
Ensuring consistent quality standards for new fuels as they emerge and fuel distribution infrastructure and equipment.	Under CEN a European standard for biodiesel (EN 14214) has been developed and a European standard for bioethanol EN 15376 is being finalized. Work is starting on increasing the limit of biodiesel (FAME) that can be added to automotive diesel under the European Standard EN 590 and bioethanol that can be added to petrol under the European Standard 228. The latter will require a modification to the Fuels Directive 2003/17/EC. European Standards for the use of LPG (EN 589)	

	and natural gas in vehicles have also been developed. There is also a group looking at hydrogen specifications.	
EC 6th Framework Programme		
The EC 6 th Framework Programme for Research, Technology Development and Demonstration has identified sustainable development as a headline research policy. The UK is involved in taking this forward in the area of Hydrogen.	DfT supported TfL's participation in CUTE project. Demonstration of 3 fuel cell buses in London.	

2.8 Health and Safety Matters		
<i>Government will continue to ensure that health and safety and environmental concerns are fully dealt with in the move to new vehicle technologies and new fuels.</i>		
Government will apply experience and expertise in future to ensure standards deal rigorously w/ environmental and health and safety etc.	Not aware of progress	
Liaison between Government and the Environment Agency and the Health and Safety Executive will continue to be fully ready to deal with future issues as they arise. The LowCVP will also cover environmental health and safety matters.	Not aware of progress. LowCVP is not taking forward H&S issues currently.	

2.9 The UK Emissions Trading Scheme		
<i>DfT will work with business transport users to develop projects through which carbon savings made in the transport sector can be brought within the Government's Emission Trading Scheme.</i>		
Summary	Progress	Comments
ETS – Transport Projects		

Government is currently working to design a projects entry route to the economy-wide greenhouse gas emissions trading scheme – launched in 2002. Through this, approved emissions reduction projects will be able to generate emissions reductions credits that can be sold on. Transport is one of the priorities.	UK ETS not taken forward due to introduction of EU ETS, which did not include transport. Letter sent by UK Ministers to EC to support the proposal for consideration of including road transport in EU ETS. DfT options paper for post Voluntary Agreement.	
LowCVP can help identify opportunities for emissions trading projects.	LowCVP undertaking work to look at ETS for transport and make recommendations.	

2.10 The Government's Vehicle Fleet		
<i>The Government will make maximum use of new vehicles and fuels in its own vehicle fleets, and encourage other public authorities to do so.</i>		
Summary	Progress	Comments
Developing Targets		
Targets for all Government Department and Agency fleets to reduce emissions by cutting mileage and consumption and using fuel efficient vehicles;	DTI led Govt Fleets working group looking at standards formed but has not met since 2005.	Needs to be re-established. LowCVP has sub-group looking into fleet advice currently.
Guidance for Local authorities		
Publishing, w/ LGA, a guide to inform local authorities of benefits for battery electrics on niche usage;	Through EST's Transport Energy programme.	Now out of date.
Regional workshops		
To be followed by regional workshops to raise awareness of cleaner fuels etc. A forum for Government fleet managers is being set up to exchange ideas etc.	Not taken forward	

9 Appendix 2

9.1 Benefit to UK plc

Securing participation in the innovation process can in itself be a powerful benefit for the UK automotive supply chain allowing it to gain competitive advantage in securing new business opportunities in addition to securing further stages of market transformation. The following case studies highlight the benefit which accrues to UK over and above the carbon emission benefits the early introduction of low carbon vehicles in the UK would achieve.

9.2 Case study 1: Benefits of Industrial Research funding

EURO 5 DIESEL – Diesel passenger car combustion and after-treatment technologies to deliver NOx emissions at Gasoline Euro 4 (0.08g/km) levels in a production-feasible manner.

The project's aim was to develop production feasible combustion and after-treatment technologies, and to demonstrate them in a D-segment passenger car (Alfa Romeo 156). The project used a Ricardo designed combustion system enabled by advanced common rail diesel technology, with lean NOx trap after-treatment to achieve this. A key part of the project was to demonstrate that production-feasible technologies could be implemented robustly with respect to production tolerances in key components.

The project was led by Ricardo UK Ltd, supported by the Dutch ministry of the environment (VROM), and the former Fiat-GM Powertrain joint venture. The project started in 2002 and was completed in 2003.

Benefits

- Secured £2.5m of R&D expenditure in the UK over a 3 year period.
- Ensured the UK developed expertise and knowledge in future passenger car diesel technology.
- Helped secure Ricardo market leading position for diesel emission control technology, providing competitive advantage for export sales to Europe, and more recently to the Far East and North America where there is rising interest in the passenger car diesel engine.
- Helped Ricardo to secure over 20 advanced engineering and production development contracts for low emission diesel engines from 10 key vehicle manufacturers and component suppliers, with a total value of over £20m. Most of these contracts come from non-UK companies.
- Places Ricardo in a strong competitive position to respond to future diesel emissions challenges such as those posed in new markets like the USA

Government Support

Supported by the Dutch Environment Ministry, VROM. Funding support of €700,000.

9.3 Case study 2: Benefits of product development funding

CHOICE – City hybrid electric bus with optimised efficiency using information and guidance systems for passenger convenience and vehicle energy consumption.

The project led by Alexander Dennis Ltd, Britain's leading manufacturer of buses, supported by seven UK organisations.

The project's aim was to design, build and evaluate a diesel series hybrid city bus incorporating vehicle and passenger information systems. The novel component of the research being the real time adaptation of engine power cycle and battery management to take account of terrain and drive cycle.

Benefits

- Secured £1.38m of R&D expenditure in the UK over a 4 year period providing employment equivalent to 17.9 man years for staff across the companies involved.
- Ensures the UK develops expertise and knowledge in future passenger bus service, in terms of efficiency/economy of use, exhaust cleanliness and passenger desirability.
- Helps secure Alexander Dennis market leading position in the UK bus market, and provides competitive advantage in export sales, particularly in the Far East and North America.
- Provides marketable skills and expertise for UK suppliers and research institutions.

Government Support

Supported through the DTI Funded through the Foresight Vehicle Programme's Hybrid, Electric and Alternative Fuelled Vehicles (HEFAV) thematic group. Funding support of £0.69m.

9.4 Case study 3: Benefit of grants for market opening

Vauxhall investment in LPG

In 1998, in response to Government policies to encourage clean fuelled vehicles, and so reduce regulated and carbon emissions, Vauxhall introduced LPG vehicles in the UK.

Benefit

All the engineering investment was made in the UK as a result of Millbrook's key skills in research, prototyping, development testing and validation. In addition the production facility was built in the UK, which at its peak was producing 4,000 vehicles per year.

GM Europe's total investment in LPG vehicles was in excess of £5m with over £1m invested in development and production facilities in the UK employing 50 staff directly. This represented inward investment from GME into the UK and was justified on the basis of securing incremental vehicle sales from fleets with a green policy and

sole supplier, and securing production facility utilisation.

Between 40%-50% of components were locally sourced with annual expenditure of approximately £1.2m during peak production which is estimated to have created employment for a further 20 to 30 staff in UK suppliers. Further UK sourcing of components might have resulted had not there been an existing European market for LPG with a mature supplier base from which major components were sourced.

The IP developed was owned in the UK and could still lead to export sales if the same kit is fitted to GM vehicles elsewhere in Europe.

Government Support

Through the EST Powershift programme which established significantly higher emission standards for clean fuelled vehicles than for equivalent petrol and diesel vehicles and than achieved by clean fuelled vehicles elsewhere in the world.