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EUROPEAN ASSESSMENT OF GLOBAL PUBLICLY FUNDED AUTOMOTIVE RESEARCH

Publicly funded automotive research in The United Kingdom

Executive Summary

The European FP7 project EAGAR (www.eagar.eu) has benchmarked the current public automotive research activities of the European Union with the national public research activities of Brazil, Canada, China, India, Japan, Malaysia, Russia, South Korea, the United States and 13 EU Member States. This report contains the results from reviewing the publicly funded automotive research activities within the UK.

Key challenges for the UK automotive sector include reducing greenhouse gas emissions and improving the competitiveness of the UK automotive industry. Since 19% of the UK's domestic CO₂ emissions come from road transport [8], decarbonising road transport is part of the UK Government's strategy for tackling climate change. The UK Government wants the UK to be a world leader in research, development, demonstration and commercialisation of ultra-low carbon vehicles [8, 15]. Targets have been set to:

- Cut transport emissions by 14% by 2020 (compared to 2008 levels)
- Obtain 10% of UK transport energy from sustainable renewable sources by 2020
- Cut new car average CO₂ to 95g/km by 2020 (40% below 2007 levels)
- See 340 electric vehicles and low carbon cars on UK roads by late 2010.

The EAGAR project identified 43 RTD programme calls issued in the UK between 1 January 2006 and 31 December 2009 that provided public funds for research projects relevant to the automotive sector. In this four year period, approximately £ 154 million of public finance was made available for automotive sector research projects (it should be noted that the EAGAR project has considered RTD activities at the national level only, and has not covered regional funding initiatives). RTD topics included in the investigation related to on-vehicle technologies and did not include the development of infrastructure.

Today, most UK publicly funded national research programmes are administered through the Engineering and Physical Sciences Research Council (EPSRC) (fundamental, academic-led research) and Technology Strategy Board (TSB) (applied research and demonstration, industry-led research). Information on current and up-coming programme calls is available on the funding organisation websites, along with instructions on the application process and funding rules. The streamlining and centralisation of the funding organisations into the UK Research Councils and TSB has reduced the number of different application procedures, making it easier for UK organisations to become familiar with what is required to apply for public funding for automotive research.

The UK public funding structure has a strong emphasis on driving innovation through making connections between academic, industrial and commercial partnerships.

Public funding for industry-led RTD activities tends to be through dedicated, specific calls, while funding for academic-led RTD activities tends to be through "responsive mode", open calls. Programme calls and the application assessment criteria are linked with UK Government strategy. Calls are issued relatively frequently, with two to four sets of calls issued each year. The majority of public funding issued during the four-year period considered in the EAGAR study was for collaborative research. Industry and universities are strongly encouraged to work together.

It is not a surprise that many of the programme calls are for research topics related to reducing vehicle CO₂ emissions through advancing internal combustion engine technology, hybridisation, electrification, improving on-board energy storage and developing intelligent control systems.

This report is a deliverable from the Project EAGAR (European Assessment of Global Publicly Funded Automotive Research - Targets and Approaches) supported by the Seventh Framework Programme.

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1 Introduction

1.1 Background

The European FP7 project EAGAR has benchmarked the current public automotive research activities of the European Union with the national public research activities of Brazil, Canada, China, India, Japan, Malaysia, Russia, South Korea, the United States and 13 EU Member States.

EAGAR identified the national road transport visions and roadmaps, research priorities, supported key topics and technology pathways, as well as the level of R&D investment for each country investigated. This enabled a direct comparison of national automotive R&D policies relating to the environment, safety and congestion.

The EAGAR study provides a key perspective on global investments designed to improve automotive vehicle technologies for a greener, safer and smarter road transport system.

1.2 Objectives

This deliverable report summarises the situation of the RTD funding system in the UK with respect to published vision statements, research targets and roadmaps, the nationally funded RTD programmes from 2006-2009 and the governance of automotive RTD funding in the UK.

The report is the basis for the subsequent benchmarking analysis, which delivers the key results of EAGAR addressing the following issues:

- Overview of national road transport visions, research agendas and roadmaps
- Comparison of automotive research priorities and investments focused on vehicle technologies
- Characteristics of national automotive research funding systems and approaches
- Highlighting areas of strength and weakness of the publicly funded RTD system in country assessed
- Potential international cooperation areas from a European perspective.

This report feeds into the benchmarking analysis work which will compare European public funding for automotive RTD with that of other developed and emerging economies. The benchmarking analysis is due to complete in September 2010 and the results will be made available from the EAGAR website WWW.EAGAR.EU as deliverable D.5.1.

1.3 Methodologies

This country report is based on comprehensive investigations of the UK's strategy for automotive RTD, based on data from the public domain, information collected from the responsible programme managers and individual feedback from experienced project managers and researchers. The methodology used was developed in the initial months of the project. It is consistent for all target countries. The data collection occurred from May to December 2009.

The four main categories for data collection were:

- General and automotive data about the country
- Published challenges, visions, targets for automotive research

- Funding organisations and hierarchies for automotive research
- National public funding programmes with calls open between in the years 2006 to 2009.

1.4 Disclaimer

This document presents quantitative and qualitative data from various sources. Due to the complexity of the project and the large amount of sources of data, regularly changing during the duration of the project, it was not possible to thoroughly validate all details. The EAGAR project partners cannot guarantee that the data presented is either complete or correct. The value of some of these data is mainly explorative, as a first step in an indicators development process. In conclusion, the data provided here may be difficult to interpret, are not exhaustive and may need further development. Comments by stakeholders on the coverage, relevance and interpretation of the indicators provided, as well as observations on new indicators that could be employed to improve the analysis of publicly funded automotive research are welcomed by the EAGAR project consortium. The EAGAR project partners and EC accept no liability for any issues that arise from actions that may be taken as a result of reading this report.

Any quotation of the data in this document should refer to the above disclaimer.

2 Description of the main WP results



Figure 1 – National Flag for the United Kingdom

2.1 General Information and Automotive Data

The United Kingdom of Great Britain and Northern Ireland (UK) is an island country located in North West Europe, separated from France by the English Channel. The UK covers a total area of 244 100 km², consisting of the island of Great Britain, part of Ireland and a number of smaller islands. The country has a population of 61 186 000¹. In 2007 the UK had the second largest economy in Europe, with a GDP of € 2049.0 billion [1].



Figure 2 – Location of UK within Europe [Source: CIA World Factbook]

¹ On 1 January 2008 [1]

The role and importance of road transport in the UK and the significance of domestic automotive industry

Road transport is an important aspect of the UK national economy. In 2007, over 689 thousand million passenger-km were travelled by road and national haulage of goods by road equated to over 160 thousand million tonne-km [1].

The UK is one of the major markets for automotive vehicles in Europe. There are 476 vehicles per thousand inhabitants in the UK [1]. In 2008 over 2.1 million new cars were registered, along with 1.3 million two-wheel vehicles and 380,000 commercial vehicles [2]. Unlike mainland Europe, British drivers drive on the left side of the road. Therefore, vehicles sold in the UK are right hand drive vehicles.

The automotive sector plays a significant role in the UK domestic industry. In 2007 the automotive manufacturing sector turned over £53.2 billion, contributing £10.3 billion to the UK economy in added value and representing 11.8% of UK exports. Over 40 companies manufacture vehicles in the UK, including seven volume passenger car manufacturers, nine commercial vehicle manufacturers, and a number of specialist niche makers. More than 1.6 million cars and commercial vehicles are produced each year, plus 3 million internal combustion engines [3,4].

Although 19 out of the top 20 global component suppliers have a base in the UK, a recent report on the future of the UK automotive industry identified that the supply chain has been severely diminished. This is of concern since 75% of the value of material of a new vehicle is added by the supply chain. The report produced a set of recommendations designed to produce a capable, competitive and integrated supply chain of strong Tier 1, Tier 2 and Tier 3 suppliers [5].

National spending and funding for research and technology development (general vs automotive sector)

In 2007, total UK domestic R&D spending was £25.5 billion (€ 36.7 billion), representing 1.79% of the gross domestic product (GDP) [1,6]. Business Enterprise (e.g. industry and commerce) contributed £16.1 billion to this domestic RTD, of which 5.9% (£945 million) was spent on research on motor vehicles and parts [7].

2.2 National Funding Organisations and Hierarchies for Automotive Research

The structure and governance of the national funding system

Since 2000, the UK public funding structure has become more centralised. Grant applications for academic-led university level research are processed by UK Research Councils. The Engineering and Physical Sciences Research Council (EPSRC) is the Research Council most relevant to EAGAR technology topics.

Public funding programmes for industry-led research are channelled through the Technology Strategy Board (TSB).

Other organisations that funded automotive research in the past, such as the Energy Savings Trust (EST) are unlikely to fund automotive research projects in the near future, since such activity is now directed through the TSB.

Figure 3 shows the flow of public RTD funds from HM Treasury, through the government departments to the organisations that administer the funds.

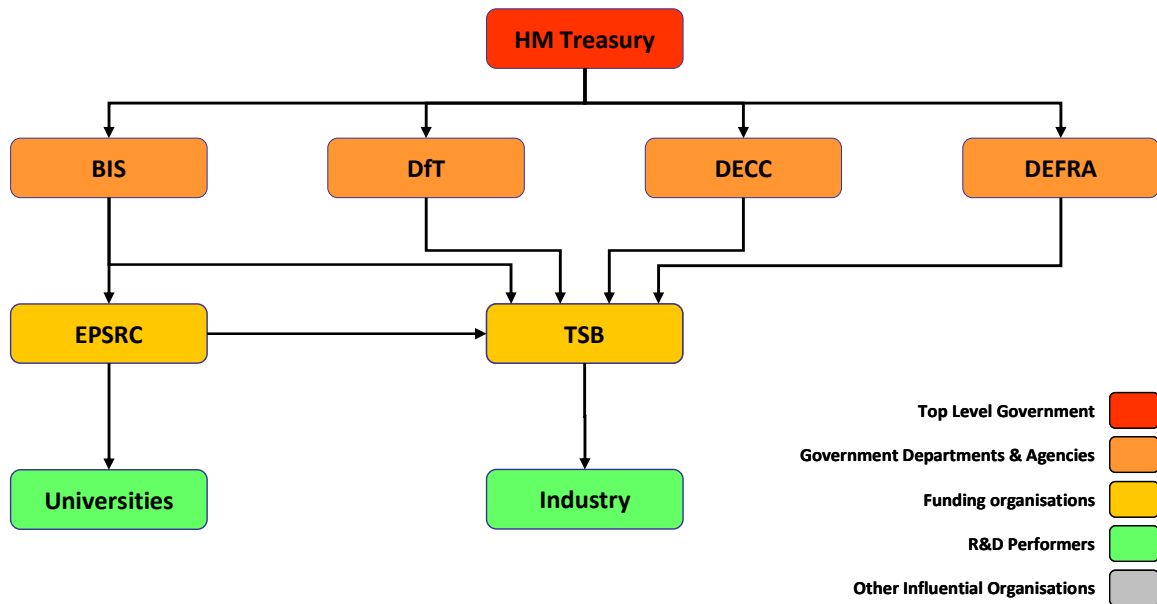


Figure 3 - UK public funding structure & key players [Source: EAGAR]

Funding organisations and key players

Department for Business, Innovation & Skills (BIS) (www.bis.gov.uk)

The Department for Business, Innovation and Skills creates government policy for growing the national economy. The department has responsibility for higher education, skills, science to innovation, enterprise and business. BIS was formed in July 2009 from the merger of the Department for Business, Enterprise and Regulatory Reform (BERR) (previously known as the Department for Trade and Industry (DTI)) and the Department of Innovation, Universities and Skills (DIUS).

Department for Transport (DfT) (www.dft.gov.uk)

The Department for Transport is the government department responsible for the nation’s transport network. The DfT’s aim is ‘transport that works for everyone’. This means a transport system which balances the needs of the economy, the environment and society. The DfT provides leadership across the transport sector to achieve its objectives, working with regional, local and private sector partners to deliver many of the services.

Department of Energy & Climate Change (DECC) (www.decc.gov.uk)

The Department of Energy and Climate Change brings together energy policy and climate change mitigation policy. The department was created in October 2008. The department’s 7 strategic objectives are:

- Secure global commitments which prevent dangerous climate change
- Reduce greenhouse gas emissions in the UK
- Ensure secure energy supplies
- Promote fairness through our climate and energy policies at home and abroad
- Ensure the UK benefits from the business and employment opportunities of a low carbon future
- Manage energy liabilities effectively and safely

- Develop the Department’s capability, delivery systems and relationships so that we serve the public effectively.

Department for Environment, Food and Rural Affairs (DEFRA) (www.defra.gov.uk)

The Department for Environment, Food and Rural Affairs aims to help people to adapt to the changes required by a low carbon, resource efficient economy, it deals with environmental risks and works to secure a sustainable society and a healthy environment. DEFRA leads the public service agreement (PSA) on the natural environment (PSA 28) and are key delivery partners for DECC’s PSA on climate change (PSA 27).

The department’s three priorities are:

- Secure a healthy natural environment and deal with environmental risks
- Promote a sustainable, low-carbon and resource-efficient economy
- Ensure a thriving farming sector and a sustainable, healthy and secure food supply.

Technology Strategy Board (TSB) (www.innovateuk.org)

The Government-backed Technology Strategy Board has the aim of driving innovation (‘Connect & Catalyse’). The TSB's role is to stimulate technology-enabled innovation in the areas which offer the greatest scope for boosting UK growth and productivity. The focus is on business and business needs. The TSB promotes, supports and invests in technology research, development and commercialisation. The TSB works closely with the UK Government and partner bodies, such as the Research Councils. The TSB advises Government on how to remove barriers to innovation and accelerate the exploitation of new technologies.

Sponsored by the UK Government, the TSB runs regular competitions for funding of collaborative R&D projects. The scope spans from large industry-led projects to smaller projects with faster timescales.

The TSB became an executive non-departmental public body in July 2007, attached to the old Department of Trade and Industry (DTI). Up to Spring 2007, publicly funded RTD programmes with an industry focus were managed by the DTI’s Technology Platform. After July 2007, such programmes were managed by the TSB on behalf of the DTI and other UK Government departments.

Engineering and Physical Sciences Research Council (EPSRC) (www.epsrc.ac.uk)

The EPSRC is one of seven Research Councils in the UK. The Research Councils are public bodies investing public money into university-led science research and technology development. The EPSRC is the UK Government's leading funding agency for research and training in engineering and the physical sciences, investing more than £850 million per year. The EPSRC provides research grants to research organisations for specific research projects and research fellowships to support leading scientists and engineers in full-time research activities. All UK Higher Education Institutions (HEI) may apply for EPSRC research grants. Independent Research Organisations may apply for funding under specific calls (targeted funding), but may not apply for general (responsive) funding. The EPSRC encourage collaboration with industry and commerce, but the lead partner (primary investigator) must be a UK HEI.

Figure 4 shows the number of programme calls per funding organisation. It should be noted that a few programmes are funded by more than one organisation.

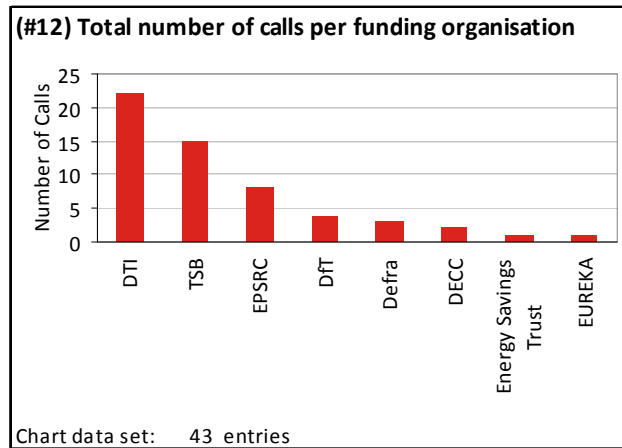


Figure 4 - Total number of calls per funding organisation [Source: EAGAR]

Remit for organisations & calls: overlaps or conflicts

Since the majority of programme calls for industry-led research are organised by the TSB, there is little overlap between programme calls. There are a few umbrella programmes, such as the Low Carbon Vehicle Innovation Platform, that have issued a series of calls over a 1-2 year period.

2.3 Automotive Visions and Strategic Research Agendas

Significant challenges for the national road transport sector

The main challenges for the UK road transport sector today are tackling greenhouse gas emissions and road congestion.

Since 19% of the UK’s domestic CO₂ emissions come from road transport [8], decarbonising road transport is part of the UK Government’s strategy for tackling climate change.

In 2006, the Eddington Study [9] linked the benefits of a high-performing transport system with national sustained economic prosperity and reducing emissions. The study found that, due to increasing travel demand, parts of the UK road networks were under significant strain at certain times of day. If left unchecked, the study forecast that the rising cost of congestion would waste £22 billion worth of time in England alone by 2025, with 13% of traffic subject to stop-start conditions.

Meanwhile, the main challenges facing the UK automotive industry are reducing tailpipe CO₂ emissions and improving fuel economy of vehicles, while remaining a global player in an increasingly competitive global market.

Visions & focused targets for road transport

Vision 1

In 2008 the UK parliament passed the Climate Change Act, becoming the first country to set a legally binding target to cut greenhouse gas emissions by at least 80% by 2050 (compared to 1990 levels). Alongside this target, the UK Government has set a series of five-year “carbon budgets” up to 2022, which have been rolled out across all Government departments [10] (see Table 1).

EAGAR – Publicly funded automotive research in the UK

	Budget 1 2008-2012	Budget 2 2013-2017	Budget 3 2018-2022
Carbon budgets (MtCO ₂ e)*	3018	2782	2544
Percentage reduction below 1990 levels	22%	28%	34%

* MtCO₂e: Million tonnes of CO₂ equivalent

Table 1 – UK Government Carbon Budgets [10]

The Committee for Climate Change (part of DECC) produces an annual report for the UK Parliament on the Government’s progress towards meeting the carbon budgets [11].

Vision 2

Like most world economies, the UK is seeking to rebuild following the credit crunch in 2008. The UK Government’s strategic vision for Britain’s recovery from the banking crisis and economic downturn includes investing in low carbon technologies to create more jobs in the new low carbon economy [12].

It is these two visions in tandem which have driven most of the targets that have been set during 2009.

“By 2050 the overall added value of the low carbon energy sector could be as high as \$3 trillion per year worldwide and it could employ more than 25 million people. So my goal is simple: I want Britain to achieve a disproportionately large share of these new global jobs.”

Gordon Brown, UK Low Carbon Economy Summit, 26 June 2008

The UK Government is committed to the EU’s ‘New Car CO₂ Regulation’ of a fleet average of 130gCO₂/km by 2015 (see Figure 5). The average CO₂ emissions of new passenger cars sold in the UK has been steadily decreasing. A reduction of 14.6% has been achieved over the past 10 years. Further reductions are expected through the EC Regulation of 120g/km by 2012-15 (10g/km from 'complementary measures') [4].

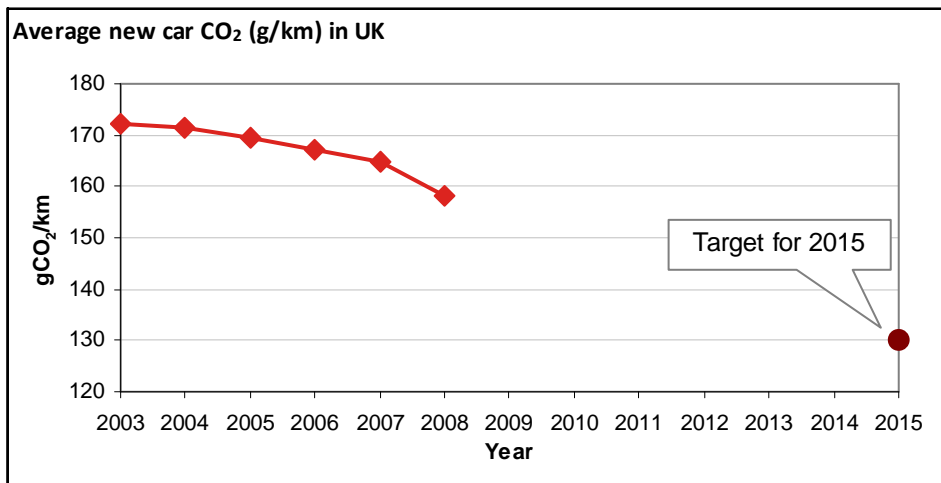


Figure 5 – Decreasing trend of average new car CO₂ in UK

In 2002 the company car tax regime was changed to a CO₂ emissions basis, as part of a package of measures that the UK Government put in place to move the UK towards a sustainable low carbon economy. Annual vehicle tax rates are also based on CO₂ emissions (for cars registered on or after 1 March 2001). Lower emitting cars are charged less, while higher emitting cars are charged more [13,14] (see Table 2).

EAGAR – Publicly funded automotive research in the UK

Band	CO₂ Emissions [g/km]	Vehicle Tax – Standard Rates Petrol and diesel cars 12 month rate	Vehicle Tax – First Year Rates (new registrations) Petrol and diesel cars 12 month rate
A	Up to 100	£0.00	£0.00
B	101-110	£20.00	£0.00
C	111-120	£30.00	£0.00
D	121-130	£90.00	£0.00
E	131-140	£110.00	£110.00
F	141-150	£125.00	£125.00
G	151-165	£155.00	£155.00
H	166-175	£180.00	£250.00
I	176-185	£200.00	£300.00
J	186-200	£235.00	£425.00
K*	201-225	£245.00	£550.00
L	226-255	£425.00	£750.00
M	Over 225	£435.00	£950.00

* Band K includes cars that have a CO₂ figure over 225g/km, but were registered before 23 March 2006

Table 2 – Vehicle tax bands from 1 April 2010 [Source: www.direct.gov.uk]

“Our priority must be to make the world's leading ultra-low carbon car industry in the UK.”

Science Minister Lord Drayson, LCV Conference, London, September 2009

The UK Government wants the UK to be a world leader in research, development, demonstration and commercialisation of ultra-low carbon vehicles [8,15]. Targets have been set to:

- Cut transport emissions by 14% by 2020 (compared to 2008 levels)
- Obtain 10% of UK transport energy from sustainable renewable sources by 2020
- Cut new car average CO₂ to 95g/km by 2020 (40% on 2007 levels)
- See 340 electric vehicles and low carbon cars on UK roads by late 2010.

To help deliver these targets, the UK government has pledged £400 million to encourage the development of ultra-low carbon vehicles:

- Approximately £230m for a scheme to provide £2000-£5000 per vehicle to support motorists buying electric vehicles (EVs) and plug-in electric vehicles (PHEVs) from 2011
- £140m for coordinated research, design and development activities, administered by the TSB Low Carbon Vehicle Innovation Platform
- Investing £30m over 2 years on low carbon buses
- Approximately £20m for developing a recharging infrastructure.

In addition, in February 2009, the UK Government opened the Automotive Assistance Programme (AAP), a £2.3 billion package to support the automotive sector in the economic downturn. The programme is tailored to support the sector's long-term future as a world leading low carbon industry.

The UK Government has set targets for the use of bio-fuels in road transport. The Renewable Transport Fuels Obligation (RTFO) requires fossil fuels suppliers to ensure that a specified percentage of the road fuels they supply in the UK is made up of renewable fuels [16]. The fuel

suppliers are also required to submit reports on the carbon and sustainability of the bio-fuels used. The RTFO is administered by the Renewable Fuels Agency, which was formed in October 2007.

The RTFO targets for the first three years are shown in Table 3:

Year:	2008/09	2009/10	2010/11
Bio-fuel use by volume	2.5%	3.25%	3.5%

Table 3 – UK Renewable Transport Fuels obligation targets [16]

The bio-fuel targets were reduced following the Gallagher Review in July 2008, which investigated the indirect effects of biofuels production [17]. The review concluded that there “probably was sufficient land for food, feed and biofuels, but urged a slowdown in the growth of biofuels to adequately control the displacement effects from change of land use”. These displacement effects included rises in food prices, reduction in biodiversity and, possibly increases in greenhouse gas emissions. The study recommended developing advanced technologies to produce biofuel from waste, residues or feedstock grown on marginal land.

In the Renewable Energy Directive, the UK Government has set a target for the transport sector to achieve 10% of energy from renewable sources by 2020, measured as a percentage of the energy consumed by road and rail transport [18]. In addition to increasing the use of biofuels, this target could be achieved through further electrification of transport, such as electric vehicles and plug-in hybrid vehicles. The interim targets for the transport sector are:

- 4.0% renewable energy in 2011-12
- 5.4% renewable energy in 2013-14
- 7.5% renewable energy in 2015-16
- 10.2% renewable energy in 2017-18

The UK Government wants to make Britain’s roads the safest in the world. Approximately 3000 people died on UK roads in 2007, with over 60% of these deaths occurring on rural roads [10]. In April 2009, a series of targets for 2020 were proposed² and published for consultation [19]:

- Reduce road deaths by 33%
- Reduce total number of serious injuries by 33%
- Reduce number of children (aged 0-17) killed or seriously injured by 50%
- Reduce number killed or seriously injured per km travelled by pedestrians and cyclists by 50%

2.4 Funding Programmes

The link between vision & targets and funding allocation

There is a clear link between the government strategy documents and the allocation of public funding for RTD activities. Frequently the strategy document will state the budget made available to a funding programme to help develop technologies in line with the strategy. Also, the

² Baseline taken as average between 2004-08

programme call brochures will reference the relevant strategy document and umbrella funding programme.

The EAGAR project identified 43 R&D programme calls issued between 1 January 2006 and 31 December 2009 which sponsored research projects relevant to the automotive sector. The majority of these R&D programme calls were related to the UK Government vision and targets.

It should be noted that the EAGAR project has considered RTD activities at the national level only, and has not covered regional funding initiatives. RTD topics included in the investigation related to on-vehicle technologies and did not include the development of infrastructure. Programme calls that included two phases (e.g. Feasibility and Full Study) were counted as two calls. Permanently open programme calls were counted as one call per year.

Figure 6 shows the number of programme calls applicable to each 'Challenge Category' investigated. It should be noted that a programme call could be applicable to more than one Challenge Category. The majority of the programme calls in the UK, issued between 2006 and 2009, were related to the challenges of increasing competitiveness, reducing fuel efficiency and GHG emissions, and reducing pollution and noise.

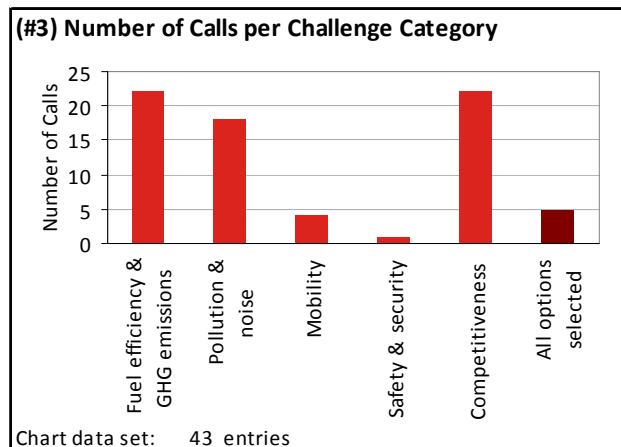


Figure 6 - Number of calls per challenge category [Source: EAGAR]

Funding programmes and states of RTD as well as different types of instruments

'Fundamental research' tends to occur in universities, which usually receive their funding through the Research Councils, such as the EPSRC. These programmes are permanently open and cover a broad range of research areas.

'Pre-competitive development' and 'Industrialisation & Commercialisation' research tends to occur within industry. The UK government channels funds for such research through the Technology Strategy Board (TSB). The TSB tends to issue dedicated calls for specific technology areas. Therefore, when considering the number of calls per research stage, the majority of calls tend towards pre-competitive development (see Figure 7).

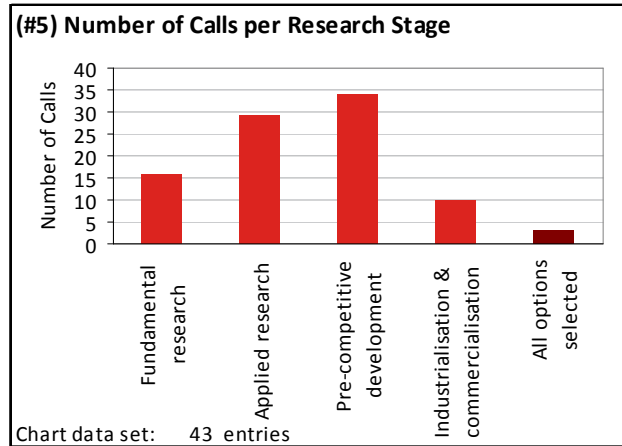


Figure 7 - Number of calls per research stage [Source: EAGAR]

Due to state aid rules, less funding is made available for the 'industrialisation & commercialisation' research stage.

The majority of UK public funding programmes issue dedicated calls targeted at specified technology areas (see Figure 8).

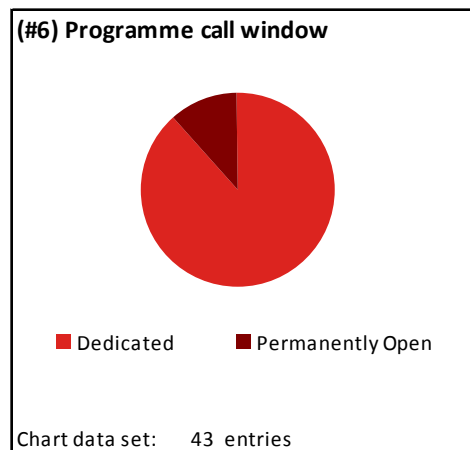


Figure 8 – Comparison between dedicated and permanently open R&D programme calls [Source: EAGAR]

The majority of UK public funding programmes are targeted at collaborative research, thus providing an incentive for companies and universities to work together (see Figure 9).

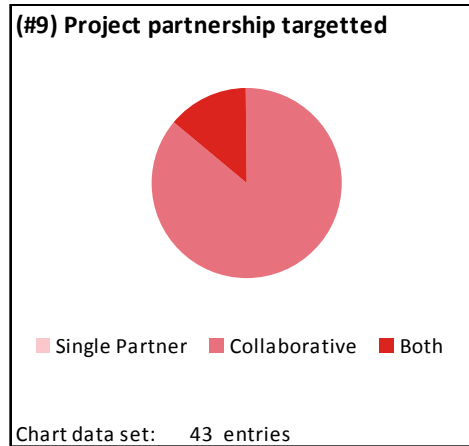


Figure 9 – Comparison between R&D programme calls that target collaborative research and calls that target single partner research [Source: EAGAR]

The UK government recognises the importance for the future national economy of encouraging universities to have a better business focus, as can be seen from combining the Department for Universities, Innovation and Skills (DUIS) with the Department for Business, Enterprise and Regulatory Reform (BERR) to form the Department of Business, Innovation and Skills (BIS) in July 2009.

An overview of the RTD budgets identified in the EAGAR study made available from national public sources by year for automotive technology topics is shown in Figure 10.

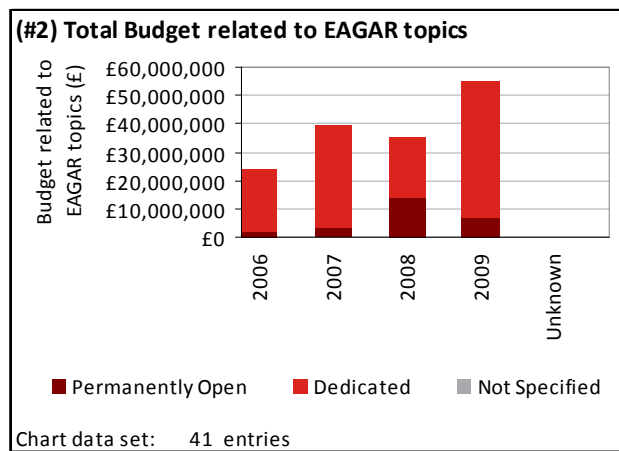


Figure 10 – Total Budget related to EAGAR Automotive R&D Topics [Source: EAGAR]

Overview of technology specific programmes for automotive RTD

An overview of the number of programme calls per automotive technology category between 2006 and 2009 is presented in Figure 11. It should be noted that a programme call may have been relevant to more than one technology category. Programme calls that were not technology specific, and therefore open to any technology category, have been categorised as “all options selected”.

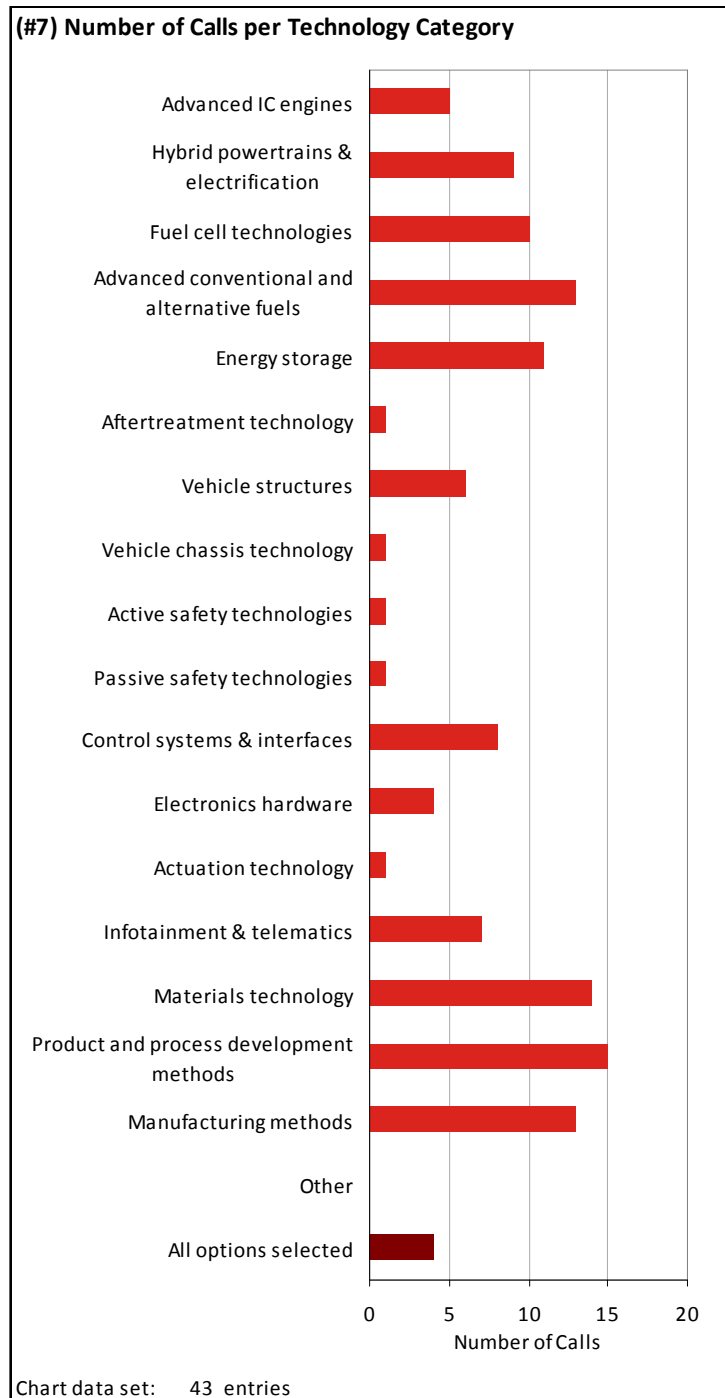


Figure 11 – Number of calls per technology category in 2006-2009 in UK [Source: EAGAR]

It is not a surprise that many of the programme calls are for research topics related to reducing vehicle CO₂ emissions through advancing internal combustion engine technology, hybridisation, electrification, improving on-board energy storage and developing intelligent control systems.

For more information, see Section 5 for the list of programme calls analysed in this study.

2.5 The efficiency, flexibility, and experienced bureaucracy of the funding process

The flexibility to release new calls in response to changing situations

As witnessed during 2008 and 2009, the UK system for public RTD funding does have flexibility to release new calls in response to changing situations if there is strong political will for the change to happen.

In the UK, once a publicly funded R&D project is running, it is possible to refine the scope of work, in response to changing situations, such as a partner withdrawing from the consortium, or unexpected research results. However the amount of public funding available is capped to the value agreed at the beginning of the project.

The application process

Within the UK today, there are primarily two funding organisations of relevance to the automotive sector, the TSB (formerly the DTI Technology Platform) and the EPSRC. Each organisation has their own application and review process, with associated bureaucracy. Information on these application and review processes is readily available on TSB and EPSRC websites [20,21]. In addition, the TSB run Applicants' Briefing days, to help potential applicants understand the purpose of the programme call, the types of projects that will be accepted and the application process.

The application process for a typical **TSB** programme call is as follows:

1. The competition opens
2. First 'Applicant Briefing Day' held (optional)
3. Applicants register their intent to apply through the TSB website and receive an application number
4. Applicants submit an 'Expression of Interest' (a short proposal for the planned project) through the TSB website
5. The TSB inform applicants if they have been accepted to the next stage of the application process. Feedback is provided to applicants that have not been successful.
6. Second 'Applicant Briefing Day' held (compulsory)
7. Applicants submit a full application proposal through the TSB website
8. Applications are reviewed by an independent review panel. Each application is reviewed by more than one reviewer. A marking system is used to rank the applications. The panel decides which projects will be awarded.
9. The TSB inform the applicants if their application for funding has been successful.

The application process from (1) competition launch to (9) final decision usually takes less than 6 months. Most applicants consider the application process straightforward. Often the TSB offer an application feedback service, which means applicants can submit a draft proposal for review prior to the submission deadline.

The applications are reviewed by an independent review panel of specialists from the relevant technology sector. The review process for full applications typically takes 1-2 months.

The TSB usually provide notification of an upcoming call several months in advance of the call launch to allow organisations more time to form consortia. The Knowledge Transfer Networks (KTNs) run partnering services to help organisations identify potential project partners.

During 2009, the TSB launched:

- Three competitions related to low carbon vehicles (previous call launched in September 2007)
- Two competitions related to fuel cell and hydrogen (previous call launched in Autumn 2007)
- One competition related to high-value manufacturing (previous call launched in Autumn 2007)
- One competition related to sustainable materials and products (previous call launched in Spring 2007).

Research Grants made available through the **EPSRC** may be “Responsive Mode” or “Targeted Mode”.

- Responsive Mode funding is flexible and capable of supporting projects requiring small value, short term grants to large, multi-million pound long-term research programmes. Responsive Mode applications may be submitted at any time (no closing date) and there is no limit on the value or length of the grant.
- For Targeted Mode funding, proposals should comply with the dates and timescales set out in the relevant programme call or announcement of opportunity. The majority of research funded by the EPSRC is through Responsive Mode programmes.

Proposals for EPSRC research grants are made electronically through the Research Councils’ ‘Joint electronic Submission’ (Je-S) system. For single-partner projects, one research proposal form and case for support is submitted. For collaborative research projects, each project partner is required to submit a research proposal form.

The assessment process for EPSRC funding applications consists of two stages.

1. In the first stage, the application proposal is peer reviewed by at least four reviewers, including at least one nominated by the investigator (project coordinator). The peer reviewers complete a form with their comments and return it to the EPSRC. The peer review stage may take anything from a few weeks to several months.

If the proposal receives highly supportive comments from at least two peer reviewers it is submitted to the second stage, the funding prioritisation panel. The reviewers' feedback is made available to the investigator and their response is given to the funding prioritisation panel.

2. In the second stage, the prioritisation panel judges the relative quality of the research proposals competing for funding. The panel members are drawn from across EPSRC's scientific remit, to ensure the necessary mix of expertise. Most members are from the academic community, but some will be from industry and other organisations. The panel produces a rank ordered list of all the research proposals considered, based on a relative assessment of quality.

The ‘Heads of Programme’ decide which proposals will be funded based on the rank ordered list and the funding available. All ‘Principal Investigators’ are notified of the outcome in writing. Successful proposals will receive a grant offer letter. An unsuccessful EPSRC proposal cannot be resubmitted.

The prioritisation panel meets every three months. However, since the dates for the prioritisation panel are not published and since an application can be submitted at any time,

it is difficult to determine the length of the EPSRC application process prior to submission. It is estimated that approximately 90% of applications are assessed within six months.

Project Implementation

It is difficult to assess the application success rate since information regarding the number of applications received per call is not published into the public domain.

The proposal assessment process tends to take between 1-2 months for TSB programme calls and up to 6 months for EPSRC applications. Therefore, the length of time between the call end date and notification of acceptance or rejection is typically 1-6 months.

After notification of a positive decision about the application, it typically takes 1-6 months to start the project depending on the type of project and the time required to prepare the legal documentation for the project consortium.

For projects funded by the TSB, cost claims are submitted at the end of each three month period as part of the quarterly review of the project progress. Once the quarterly cost claims have been accepted by the TSB, the funds are transferred to the project coordinator, who then distributes this to the project partners. The process is thought to work well. However, the TSB is seeking to improve the process and is investigating options that would allow funds to be transferred directly to the project partners.

For EPSRC funding grants, a payment profile is set out in the grant offer letter. Payments are made quarterly to the research organisation through the Banks Automated Clearing System (BACS).

RTD projects funded by the TSB are reviewed every three months throughout the duration of the project. The review process involves submitting an activity report, cost claims and holding a Quarterly Review Meeting. Each TSB project is assigned a Project Monitoring Officer, who is responsible for these reviews and who maintains regular contact with the project, to ensure the successful completion of the project.

Funding process - exploitation

The TSB requires funded projects to produce an Exploitation Plan. The first version of this plan must be delivered at the end of the second quarter (within the first six months). The Exploitation Plan describes how the consortium intends to exploit the results of the RTD project. The project results may not necessarily be published into the public domain. The project consortium is also required to regularly review intellectual property (IP) to ensure the technology under development does not infringe other patents.

At the university level, the UK Government is beginning to outline requirements for research grant applications to include a business case justification. These 'Impact Plans' or 'Economic Packs' must explain how the proposed research will benefit knowledge, people, society and the UK economy.

Funding process – feedback

For TSB funded projects, since project consortium members meet quarterly with the Project Monitoring Officer, there is an opportunity to discuss any problems encountered with the funding process. Also, since cost claims are submitted for every three months of work, there is a shorter time delay between doing the work and receiving the funding compared to funding programmes with annual cost claims.

No information is available on the feedback process for EPSRC projects.

Transparency & openness

Information on new specific programme calls is readily available on the funding organisation websites. Sometimes the TSB will publicise upcoming programme calls several months in advance. The Knowledge Transfer Networks work closely with the TSB and will contact their members by email, or through their website, to inform them of new programme calls that may be of interest.

Although the EPSRC do publish information on specific targeted funding opportunities, less information is available on the prioritisation of responsive mode funding requests. Requests for responsive mode grants can support a wide variety of activities from feasibility studies to technology development, within the broad remit of research into engineering, mathematics, physics, chemistry, materials science, information and communication technologies. Often EPSRC applicants do not know the "hot topics" at the time of application and the EPSRC prioritisation criteria can change depending on the Government's objectives. Therefore, it is possible for a proposal to be rejected because the research topic is not in favour at the time of the application review.

The EAGAR study involved conducting a survey of historic programme calls which were active between January 2006 and December 2009. The majority of the data required for comparing funding programmes was available from public domain sources (see Figure 12). In most cases, data that was not readily available in the public domain was obtained directly from contacts at the relevant funding organisation.

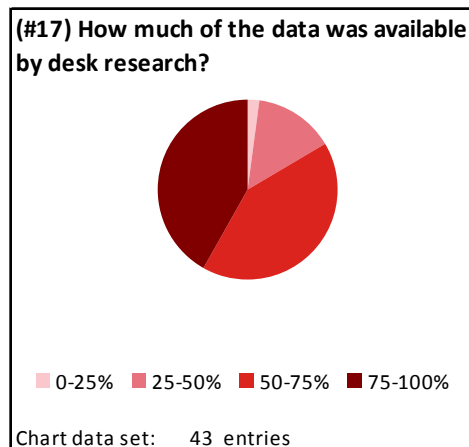


Figure 12 – Pie Chart to illustrate the portion of information on UK publicly funded RTD programmes that was available from public domain sources [Source: EAGAR]

Although the TSB require funded projects to produce an Exploitation Plan, they do not require projects to publish project results into the public domain (regardless, results are usually published anyway).

Since EPSRC grants are mainly issued to academic institutions, there is an expectation that the researchers will publish technical papers and give conference presentations on the work that has been funded.

Foreign collaboration

The majority of UK public funding programmes are not open to foreign organisations (in a sample of 43 UK RTD publically funded programmes, less than 19% were open to foreign organisations). A company must have a significant UK base, e.g. research and development centre, to be eligible for public RTD funding.

3 Discussion and Conclusion

The automotive sector plays a significant role in the UK domestic industry. Over 40 companies manufacture vehicles in the UK, including seven volume passenger car manufacturers, nine commercial vehicle manufacturers, and a number of specialist niche makers. The UK is known as a centre for design and development engineering, home to seven Formula 1 teams and several of the world's leading automotive consultancies [3].

The EAGAR project identified 43 RTD programme calls issued in the UK between 1 January 2006 and 31 December 2009 that provided public funds for research projects relevant to the automotive sector. In this four year period, approximately £ 154 million of public finance was made available for automotive sector research projects. It should be noted that the EAGAR project has considered RTD activities at the national level only, and has not covered regional funding initiatives. RTD topics included in the investigation related to on-vehicle technologies and did not include the development of infrastructure. Programme calls that included two phases (e.g. Feasibility and Full Study) were counted as two calls.

Historically, most of the publicly funded research programmes with an industry focus were administered by the UK Government Department of Trade and Industry (DTI), until the Technology Strategy Board (TSB) took over this role in July 2007. Today the TSB provides centralised administration of publicly funded, business-led RTD activities, with finance supplied from at least four different Government departments. Projects funded by the TSB tend to be in the applied research and pre-competitive development stages of RTD.

Public funding for academic-led RTD activities tends to occur through the UK Research Councils, of which the Engineering and Physical Sciences Research Council (EPSRC) is of most relevance to the automotive sector. Projects funded by the EPSRC tend to be in the fundamental research stage.

Other organisations that funded automotive research in the past, such as the Energy Savings Trust (EST) are unlikely to fund automotive research projects in the near future, since such activity is now directed through the TSB.

Many of the funding programmes have focused on meeting the key challenges of reducing fuel consumption and CO₂ emissions, reducing pollution and noise, and improving the competitiveness of the UK automotive industry.

As part of the national strategies for reducing CO₂ emissions and rebuilding the economy following the 2008-09 recession, the UK Government has invested in the technology development and demonstration of low carbon vehicle technologies. For example, the TSB Low Carbon Vehicles Innovation Platform ran four competitions for funding in 2009. The overall objective of these RTD programmes, and other related initiatives, is to make the UK a world leader in research, development, demonstration and commercialisation of ultra-low carbon vehicles.

The majority of the RTD programme calls issued in the UK are dedicated, with set deadlines for registering interest and submitting applications. Information on these competitions for funding is readily available through the TSB and Research Council websites. Participation is open to all types of organisations. Frequently academic-led research is encouraged to include industrial or commercial partners, and business-led research is encouraged to include universities and research institutions. However, opportunities for foreign organisations to receive public funding is limited, unless they have a significant R&D footprint with the UK.

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5 Annex

Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
The Technology Programme Autumn 2005 Competition for Funding	Design and Manufacture of Sustainable Products	The competition offers a challenge to forward-thinking organisations to collaborate in the research and development of innovative, sustainable products. Provided in conjunction with Defra's Business Resource Efficiency and Waste (BREW) programme	31-Jan-2006 (Registration of Intent) 6-Feb-2006 (Application Submission)	DTI, Defra	http://www.dius.gov.uk/~media/publications/F/file14982
The Technology Programme Autumn 2005 Competition for Funding	Low Carbon Energy Technologies	This competition will support the renewable technologies detailed overleaf, along with hydrogen and fuel cell technologies, intelligent grid management and for the first time under the Technology Programme carbon abatement technologies.	31-Jan-2006 (Registration of Intent) 6-Feb-2006 (Application Submission)	DTI	http://www.dius.gov.uk/~media/publications/F/file14984
The Technology Programme Autumn 2005 Competition for Funding	Materials Modelling	Collaborative Research and Development projects that apply predictive materials modelling techniques to meet industrial needs	31-Jan-2006 (Registration of Intent) 6-Feb-2006 (Application Submission)	DTI	http://www.dius.gov.uk/~media/publications/F/file14985
The Technology Programme Autumn 2005 Competition for Funding	Power Electronics and Electrical Power Control Systems	Funding is available to support advances in the innovative design and development of power electronics and electrical power control systems	31-Jan-2006 (Registration of Intent) 6-Feb-2006 (Application Submission)	DTI	http://www.dius.gov.uk/~media/publications/F/file14987
The Technology Programme Spring 2006 Competition for Funding	Design Engineering & Advanced Manufacturing: Management of complex fluid flow conditions TWO STAGE	Research to radically advance our ability to model, measure, manipulate and control the movement of fluids of all kinds in a range of environments	12-Jun-2006 (Registration of Intent)	DTI	http://www.berr.gov.uk/files/file27921.pdf

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
The Technology Programme Spring 2006 Competition for Funding	Design Engineering & Advanced Manufacturing: Management of complex fluid flow conditions FAST TRACK	Research to radically advance our ability to model, measure, manipulate and control the movement of fluids of all kinds in a range of environments	12-Jun-2006 (Registration of Intent)	DTI	http://www.berr.gov.uk/files/file27921.pdf
The Technology Programme Spring 2006 Competition for Funding	Advanced Materials: Materials for Extended First Use and Re-use TWO STAGE	Funding for research in materials technologies that address current barriers to the development of more durable products or discourage materials/products to be re-used	12-Jun-2006 (Registration of Intent)	DTI	http://www.berr.gov.uk/files/file27917.pdf
The Technology Programme Spring 2006 Competition for Funding	Advanced Materials: Materials for Extended First Use and Re-use FAST TRACK	Funding for research in materials technologies that address current barriers to the development of more durable products or discourage materials/products to be re-used	12-Jun-2006 (Registration of Intent)	DTI	http://www.berr.gov.uk/files/file27917.pdf
The Technology Programme Spring 2006 Competition for Funding	Information & Communication Technology: Data, Scientific and Medical Visualisation for innovative products and services FAST TRACK	This competition seeks Collaborative Research and Development applications from consortia of at least two partners, at least one of which must be from UK industry, into the challenges posed by visualisation and virtual / augmented reality. Projects may be business-to-business or science-to-business and may be Basic, Applied, Experimental or some combination of the three.	12-Jun-2006 (Registration of Intent)	DTI	http://www.berr.gov.uk/files/file27922.pdf
The Technology Programme Spring 2006 Competition for Funding	Emerging Energy Technologies: Low Carbon Energy Technologies	The competition supported a relatively broad portfolio of low carbon technologies, with a focus on specific barriers that needed to be addressed to accelerate technology development	19-Jun-2006	DTI	dti - Competition Document

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
The Technology Programme Autumn 2006 Competition for Funding	Emerging Energy Technologies: Low Carbon Energy Technologies	This competition will support a range of renewable technologies, along with hydrogen and fuel cell technologies and intelligent grid management.	15-Jan-2007	DTI	http://www.berr.gov.uk/files/file34918.pdf
The Technology Programme Autumn 2006 Competition for Funding	Plastic Electronics: Novel Materials, Deposition and Patterning Techniques	Plastic Electronics is an emerging technology that requires further research and development of most, but not necessarily all, of the following: <ul style="list-style-type: none"> • Novel materials (for example, organic semiconductors, light emitting materials, printable conducting layers); • Novel manufacturing processes, especially those viable at a smaller scale (for example, additive printing, laser transfer, micro contact); and • Novel substrates and packages (for example plastic films, package-free electronics) 	8-Jan-2007 (Registration of Interest) 15-Jan-2007 (Application)	DTI	http://www.berr.gov.uk/files/file34921.pdf
The Technology Programme Autumn 2006 Competition for Funding ZEE	Moving Towards the Zero Emission Enterprise – A challenge to business to reduce their diverse negative environmental impacts FEASIBILITY STUDIES	This competition provides a challenge and an opportunity for UK industry and academia to deliver innovative and sustainable long-term solutions to realising the goal of Zero Emission Enterprise	8-Jan-2007 (Registration of Interest) 15-Jan-2007 (Application)	DTI, DEFRA	http://www.berr.gov.uk/files/file34922.pdf
The Technology Programme Autumn 2006 Competition for Funding ZEE	Moving Towards the Zero Emission Enterprise – A challenge to business to reduce their diverse negative environmental impacts FULL STAGE	This competition provides a challenge and an opportunity for UK industry and academia to deliver innovative and sustainable long-term solutions to realising the goal of Zero Emission Enterprise	8-Jan-2007 (Registration of Interest) 15-Jan-2007 (Application)	DTI, DEFRA	http://www.berr.gov.uk/files/file34922.pdf

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
Hydrogen, Fuel Cell and Carbon Abatement Technologies (HFCCAT) Demonstration Programme	HFCCAT Demonstration Programme - First Call Autumn 2006	First call under the HFCCAT Demonstration Programme	24-Nov-2006	DTI	www.hfccat-demo.org
The Technology Programme Spring 2007 Competition for Funding	Design Engineering and Advanced Manufacturing	Financial support for new research and development projects that enable further technological advances or significantly reduce risk in the manufacturing area. Applications should include the technology innovator(s) and end-users and show how they will exploit all outputs of the research. The successful consortium must clearly justify why government support is essential and how the project will meet the criteria for support.	11-Jun-2007 (Registration of Intent) 18-Jun-2007 (Outline Application)	DTI	http://www.southeastknp.co.uk/uploads/AdvancedManufacturing.pdf
The Technology Programme Spring 2007 Competition for Funding Intelligent Transport Systems Services (ITSS) Innovation Platform (IP)	Future Intelligent Transport Systems (FITS) October 2006 / January 2007	The underpinning theme is studies on the challenge of delivering better passenger and freight transport services while at the same time reducing negative environmental impacts especially the carbon footprint.	03-Nov-2006 (Expression of Interest)	DTI / DfT / EPSRC	http://www.berr.gov.uk/files/file34263.pdf
The Technology Programme Spring 2007 Competition for Funding	Lightweight Materials and Structures	Funding is available for Collaborative Research and Development in materials technologies that will enable the UK to rapidly meet the global challenge to reduce the weight of materials and structures.	11-Jun-2007 (Registration of Intent) 18-Jun-2007 (Outline Application)	DTI	http://www.southeastknp.co.uk/uploads/LightweightMaterials.pdf
The Technology Programme Spring 2007 Competition for Funding	Plastic Electronics	To support highly innovative collaborative research proposals in the development and processing of novel functional materials, device design and systems integration	11-Jun-2007 (Registration of Intent) 18-Jun-2007 (Outline Application)	DTI	http://www.southeastknp.co.uk/uploads/PlasticElectronics.pdf

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
The Technology Programme Spring 2007 Competition for Funding Intelligent Transport Systems Services (ITSS) Innovation Platform (IP)	Time, Distance and Place (TDP) road pricing Type 1:ITSS	Competition for the technology development of products for Time, Distance and Place (TDP) charging. This second ITSS IP competition for “Time, Distance and Place road pricing” (TDP) was launched in parallel with the DfT’s Road Pricing Demonstrations Project.	20-Jul-2007 (Registration of Intent) 27-Jul-2007 (Application)	DTI	http://www.innovits.com/showdoc.asp?keywords=road-pricing-technology-strategy-board-innovation-platform&doc_id=258
The Technology Programme Spring 2007 Competition for Funding Intelligent Transport Systems Services (ITSS) Innovation Platform (IP)	Type 2: ITSS Full Stage	Competition for the technology development of products for Time, Distance and Place (TDP) charging. This second ITSS IP competition for “Time, Distance and Place road pricing” (TDP) was launched in parallel with the DfT’s Road Pricing Demonstrations Project.	20-Jul-2007 (Registration of Intent) 27-Jul-2007 (Submissions of Interest)	DTI	http://www.innovits.com/showdoc.asp?keywords=road-pricing-technology-strategy-board-innovation-platform&doc_id=258
The Technology Programme Spring 2007 Competition for Funding	Low Carbon Energy Technologies	The programme includes a range of renewable technologies, along with hydrogen and fuel cell technologies, intelligent grid management and carbon abatement technologies.	11-Jun-2007 (Registration of Intent) 18-Jun-2007 (Outline Application)	DTI	http://www.southeastknpc.co.uk/uploads/LowCarbonEnergy.pdf
Technology Strategy Board Autumn 2007 Competition for Funding	High Value Manufacturing	TSB's broad aim is to invest in UK manufacturing companies to maintain and develop their international competitiveness. This aim will be achieved by focusing on innovation in four board areas - Products; Production Processes; Service Systems; and Value Systems	11-Jan-2008 (Registration of Intent) 14-Feb-2008 (Full Applications)	TSB	TSB - Competition Document

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
Technology Strategy Board Autumn 2007 Competition for Funding	Low Carbon Energy Technologies Autumn 2007	This competition will support a broad portfolio of low carbon technologies that will focus on specific barriers. The programme includes intelligent grid integration and management, carbon abatement technologies, hydrogen and fuel cells, microgeneration and photovoltaics and bioenergy.	22-Feb-2008 (Registration of Intent)	TSB	TSB - Competition Document
Technology Strategy Board Autumn 2007 Competition for Funding	Gathering Data in Complex Environments	This call invites proposals for Collaborative Research and Development projects that overcome the commercial and technical barriers to tracking, monitoring and control for identified end-users to enable data to be gathered that cannot be currently. Proposals should emphasise sensor networking (including remote sensing) in large-scale, complex and/or high-density environments.	22-Feb-2008 (Expression of Interest)	TSB	https://www.technologyprogramme.org.uk/extranet/competitions/Autumn07/Documents/PriorityDescriptions/TSB_DataEnvironment.pdf
Low Carbon Vehicles Innovation Platform	Low Carbon Vehicles Innovation Platform First Technology Competition, September 2007	Demonstration of a range of potential mass-market innovations delivering 'meaningful carbon savings' for road vehicles	5-Nov-2007 (Registration of intent to submit)	TSB (48%) DfT (52%)	TSB - Competition Document
Intelligent Transport Systems Services (ITSS) Innovation Platform (IP)	Informed Personal Travel November 2008	Intervention aimed at providing reliable, accurate, and credible information for people to manage their journeys - Informed Personal Travel (IPT) information - to encourage people to consider the use of alternative means of transport other than the vehicle	18-Dec-2008 (Expression of Interest)	TSB	TSB - Competition Document

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
Technology Strategy Board November 2008 Competition for Funding	Sustainable Materials and Products	Funding is available for industry-driven projects focused on materials technologies that will enable the UK to rapidly meet urgent and difficult environmental and social challenges and to create wealth, via the development and implementation of new or improved materials, processes and products.	18-Dec-2008 (Expression of Interest)	TSB	http://www.innovateuk.org/assets/pdf/competition_documents/sustainable%20materials%20and%20products_071008.pdf
Low Carbon Vehicles Innovation Platform	Ultra-Low Carbon Vehicle Demonstrator January 2009	Highly innovative, industry-led collaborative research in the field of ultra low carbon vehicle (< 50g CO ₂ /km, with zero-emission range > 35km) development and demonstration. The competition contributes towards building up a UK-wide fleet for at least 100 passenger vehicles for delivery in late 2009/early 2010, to be used in a real world environment over at least 12 months. The competition focuses on EVs and PHEVs. Motorcycles, quadricycles and tricycles are excluded from this competition	28-Jan-2009	TSB	http://www.innovateuk.org/assets/pdf/tsb_ultralowcarvehcompflyer%20(2).pdf
High Value Manufacturing: Step Change in Competitiveness; Value Systems	High Value Manufacturing: Step Change in Competitiveness; Value Systems January 2009	TSB's broad aim is to invest in UK manufacturing companies to maintain and develop their international competitiveness. This aim will be achieved by focusing on innovation in four board areas - Products; Production Processes; Service Systems; and Value Systems	26-Feb-2009	TSB, with small contributions from EPSRC and ESRC	http://www.innovateuk.org/assets/pdf/competition_documents/highvalmanufacturing_competition_071008.pdf
Low Carbon Vehicles Innovation Platform (LCVIP) / LCV Integrated Delivery Programme (IDP)	Ultra-efficient systems for the market advancement of electric and hybrid vehicles January 2009	Highly innovative collaborative research projects in the field of ultra-efficient electrical systems for electric and hybrid vehicles	26-Feb-2009	TSB	http://www.innovateuk.org/assets/pdf/competition%20-%20ultra%20efficient%20systems.pdf

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
Energy Generation and Supply: Fuel cells and hydrogen technologies	Energy Generation and Supply: Fuel cells and hydrogen technologies March 2009	Highly innovative collaborative research and development in the area of Fuel Cells and Hydrogen Technologies. Focus on development of technologies and their associated supply chains to offer significant quantitative improvements in lowering costs, improving durability, addressing the challenges of hydrogen generation, storage and utilisation and acceleration deployment to market	23-Apr-2009	TSB	TSB - Competition Document
Low Carbon Vehicles Innovation Platform (LCVIP) / LCV Integrated Delivery Programme (IDP)	Low Carbon Vehicles Integrated Delivery Programme Competition 2 - Innovation Focus Area 1 June 2009	This competition is focused on developing robust industry-led consortia capable of developing vehicle-centric technologies that will encourage the advancement of mass market adoption of low carbon vehicles. LCV Integrated Delivery Programme (IDP) Competition 2	6-Aug-2009 (Expression of Interest)	TSB / DfT, EPSRC	http://www.innovateuk.org/assets/pdf/LowCarbonVehiclesCompFlyerJune09.pdf
Low Carbon Vehicles Innovation Platform (LCVIP) / LCV Integrated Delivery Programme (IDP)	Low Carbon Vehicles Integrated Delivery Programme Competition 2 - Innovation Focus Area 2 June 2009	This competition is focused on developing robust industry-led consortia capable of developing vehicle-centric technologies that will encourage the advancement of mass market adoption of low carbon vehicles. LCV Integrated Delivery Programme (IDP) Competition 2	6-Aug-2009 (Expression of Interest)	TSB / DfT, EPSRC	http://www.innovateuk.org/assets/pdf/LowCarbonVehiclesCompFlyerJune09.pdf

EAGAR – Publicly funded automotive research in the UK

Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
Hydrogen, Fuel Cell and Carbon Abatement Technologies (HFCCAT) Demonstration Programme	Fuel Cells and Hydrogen Demonstration Programme September 2009 STRAND 1	The objective of this programme is to fill a current gap in the innovation chain, relating to scaling up and accelerating deployment of FC&H ₂ technology for both transport and stationary market applications. The programme will facilitate demonstration projects of FC&H ₂ vehicle fleets, residential CHP and H ₂ production from non-carbon sources. The programme will also aid development of production processes for mass manufacture of the technology and in-line product testing.	1-Oct-2009 for Strand 1	TSB / DECC	http://www.innovateuk.org/assets/pdf/TSB_FuelCellsHydrogen%20v3.pdf
Hydrogen, Fuel Cell and Carbon Abatement Technologies (HFCCAT) Demonstration Programme	Fuel Cells and Hydrogen Demonstration Programme September 2009 STRAND 2	The objective of this programme is to fill a current gap in the innovation chain, relating to scaling up and accelerating deployment of FC&H ₂ technology for both transport and stationary market applications. The programme will facilitate demonstration projects of FC&H ₂ vehicle fleets, residential CHP and H ₂ production from non-carbon sources. The programme will also aid development of production processes for mass manufacture of the technology and in-line product testing.	12-Oct-2009 for Strand 2	TSB / DECC	http://www.innovateuk.org/assets/pdf/TSB_FuelCellsHydrogen%20v3.pdf
Exceptional Projects	Exceptional LCV Project	A project to develop a new all-electric urban car, that will be affordable for many consumers when it reaches market and manufactured using an innovative and sustainable production process.	2009	TSB	TSB Press Release, issued 4-Nov-2009

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
EPSRC	EPSRC (2006)	EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences, investing around £740 million a year in a broad range of subjects – from mathematics to materials science, and from information technology to structural engineering.	No end date	EPSRC	www.epsrc.ac.uk
EPSRC	EPSRC (2007)	EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences, investing around £740 million a year in a broad range of subjects – from mathematics to materials science, and from information technology to structural engineering.	No end date	EPSRC	www.epsrc.ac.uk
EPSRC	EPSRC (2008)	EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences, investing around £740 million a year in a broad range of subjects – from mathematics to materials science, and from information technology to structural engineering.	No end date	EPSRC	www.epsrc.ac.uk
EPSRC	EPSRC (2009)	EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences, investing around £740 million a year in a broad range of subjects – from mathematics to materials science, and from information technology to structural engineering.	No end date	EPSRC	www.epsrc.ac.uk

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Overall programme initiative name	Programme call name	Programme call description	Programme call end date	Funding organisation	Main point of reference
Low carbon research and development grant	Low carbon research and development Call 3	The scheme is supporting - through grant funding - the development of new low carbon vehicle technologies. This call sets out to encourage the development of energy storage systems to provide significant improvement in the efficiency and performance of low carbon vehicles.	31-Oct-2006	EST	http://www.energysavingtrust.org.uk/business/Business/Transport-in-business/Funding-and-grants/Low-carbon-research-and-development-grant
EUREKA	E!4439 ECONTEC M-PSWN	Pre-Emptive Security Wireless In Mobility	2008	EUREKA	http://www.eureka.be/inaction/AcShowProject.do?id=4439