HM Government

Best of British

How the UK is securing global advantage in the technologies and sectors of the future to ensure growth and jobs

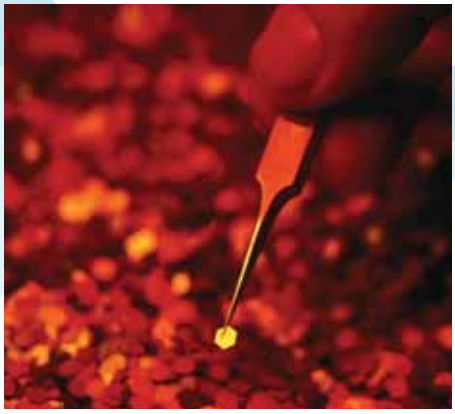
Building Britain's Future

The sectors featured in this pack represent the best of British talent and innovation. They also represent fantastic investment opportunities.

These are areas in which Britain leads on innovation, enterprise and technology, and has a real competitive advantage. We lead the G8 on scientific productivity, are home to four of the world's top six universities, and produce a disproportionate number of Nobel laureates.

This gives us the capacity to generate economic growth and jobs, and to advance frontiers in renewable energy, communications and healthcare.

Synthetic biology will revolutionise the treatment of disease. Composite materials will enable us to build lighter aircraft that use less fuel. Satellites designed and manufactured in Britain will deliver high-speed broadband to people across Europe.



Growth potential

The forecasts for growth in these industries and others are compelling.

This country's renewable energy sector is set to grow at more than five per cent a year. It already employs a quarter of a million people, including the supply chain.

Global growth in life sciences, which provides 120,000 UK jobs, could be as much as 12 per cent over the coming years.

And in an emerging sector like plastic electronics the global market is projected to grow from $2 billion today to $120 billion in 2020. This rapid expansion will create up to 20,000 jobs and generate a wealth of economic opportunities for the UK.

Government support

Sustainable economic growth is the Government's number one priority.

Building the industries of the future and enabling British innovation to flourish in the global market requires an active government committed to investing in the fundamentals of British economic competitiveness.

That is why we are investing in precisely these areas where Britain has that competitive edge: from science and skills through to new technologies and businesses.

We have allocated nearly £1 billion to the Strategic Investment Fund to develop the UK's industrial strength and infrastructure.

We are introducing the patent box – a reduced rate of corporation tax from 2013 for income which stems from patents exploited in the UK.

We will focus on measures that support high-growth technology companies. Despite comprising only a small minority of businesses, they have been responsible for almost half of all net employment growth in the private sector.

And we are working closely with key industries such as automotive and life sciences – as well as the UK research base – to exploit the clear growth potential in ultra-low carbon transport and healthcare.

It is through such policies and partnerships that we can make the UK a great place to both work and invest.

Advanced composites

Advanced composites are a key material for modern manufacturers, with huge growth opportunities in many areas including aerospace and the manufacture of wind turbine blades.

Advanced composites

The sector

Advanced composites are lightweight, strong, durable and high-performance materials at the forefront of manufacturing technology. Britain is already a world leader in composites for the manufacture of civil and military aircraft, where their high-performance and lightweight qualities are delivering significant savings in running costs and carbon emissions. And the UK's expertise in this area means it is the base for eight Formula 1 teams which use composite materials in their high-performance cars.

The market

The world composites market is predicted to grow from £53bn to £74bn by 2013, driven initially by the aerospace and wind energy sectors, where demand for composite materials is expected to grow by around 15% and 13% each year respectively. The UK composites market is currently worth £1bn annually and employs approximately 40,000 people. The opportunities in the UK wind turbine blade and aerospace markets alone will be worth an estimated £22bn by 2020.

Opportunities

The key challenge is the future development of cost-effective manufacturing technologies that enable the rapid production of advanced composites. No country has as yet fully developed this capability. If the UK succeeds in meeting this challenge, it can drive the greater uptake of advanced composites across a range of new sectors as well as maintaining its existing competitive advantages in aerospace and high-performance cars.

The strength and stiffness of advanced composites make them ideal for the production of the giant blades for the next generation of wind turbines for the offshore wind industry, a market growing rapidly in the UK. There is a potential to install 32GW of offshore wind energy in UK waters by 2020 – currently less than 1GW is generated from offshore wind, representing a major opportunity for manufacturers of wind turbine blades. The Crown Estate's 'Round Three' offshore wind licensing programme, which granted rights in nine UK coastal zones in January, could see an extra 6,400 wind turbines by 2020, potentially utilising 19,000 composite blades.

In February, construction work began for the new Clipper Windpower facility on the banks of the River Tyne in Newcastle. This new factory will use advanced composites to build the world's largest wind turbine blades at 72 metres each for the wind turbine of the Clipper 'Britannia'. This new facility will be a major source of employment, creating up to 500 jobs by 2020.

Also in February, Mitsubishi Power Systems Europe signalled their intention to invest up to £100m in an offshore wind turbine project in the UK that will create up to 200 highly skilled jobs.

Progress

To help deliver these opportunities in the UK, the Government is providing £12m for a National Composite Centre in Bristol and £6m for a Composite Grand Challenge led by the Technology Strategy Board which aims to spark innovation solutions for the rapid manufacture of cost effective composite structures.

www.bis.gov.uk/advancedmanufacturing

Key facts

There has been significant increase in the use of composites in civil aircraft in recent years – from around 10% to 15% of structural weight to 50% for the Boeing 787 and the Airbus A350 XWB.

The UK composites market currently is worth £1bn annually and the world market is predicted to grow from £53bn to £74bn by 2013.

The composite opportunities in the UK wind turbine blade and aerospace markets alone will be worth an estimated £22bn by 2020.

Creative industries

The UK is an international hub for creativity and commerce, with a sector bigger in terms of percentage of GDP than any other OECD country.

Creative industries

The sector

The UK creative industries are broad, covering advertising, architecture, the art and antiques market, crafts, design, designer fashion, film, video games, music, the performing arts, publishing, software and computer services, and television and radio.

The market

The creative industries contribute 6.2% to the UK economy, with nearly 2 million people in creative employment. NESTA estimates the creative industries will grow on average more than double the rate of the rest of the economy. These companies are competing in a worldwide market in creative industries worth around 7% of global GDP. The UK is a world leader in sales of TV formats, and is the second biggest exporter of TV programming hours. We have the largest music market in the EU and the third largest worldwide. In computer games, the UK has the biggest developer base in Europe, employing around 10,000 people.

Opportunities

UK games studios are responsible for the creation of ground-breaking and iconic titles. In the fast growing genre of social gaming, UK company Playfish has been leading the way with award-winning games for people to play together. The company has changed the way people play games by creating more social and connected experiences. To date, more than 150 million Playfish games have been installed and played by millions of people worldwide.

The UK is home to world leaders in digital post-production technology. Filmlight has grown from very small R&D start-up to world leader in digital post-production technology in just eight years. Recently awarded four Academy Sci-Tech 'Oscars', the Soho firm has lifted annual sales to £15m, 90% of which is exported. Its advanced technology systems are used by the top Hollywood and Bollywood studios and broadcasters worldwide.

The UK's creative infrastructure is now developing fast. MediaCityUK, a major new hub accommodating 1,150 creative and related businesses, is being built at Salford Quays. It is expected to create more than 10,000 jobs and generate more than £225m a year in additional net value added upon completion in 2011.

UK publishers are embracing digital technology to provide compelling content across educational scholarly and consumer publications. The export of books alone is in excess of £1bn.

Progress

Government is investing £3.5m in two centres of excellence – in Abertay University Dundee and the MediaCityUK development in Salford Quays – to promote innovation, product development and skills for the UK video games industry. With complementary regional and European funding a total of more than £10m will be invested in the centres which will aim to create 30 new companies, assist 80 others and stimulate 400 new jobs.

The Government is offering legislative support for creative industries. The Digital Economy Bill, for example, contains practical and effective measures to tackle online infringement of copyright, which is fundamental to the future viability of a range of sectors.

The combination of existing strengths and a commitment to supporting future growth is convincing international companies to locate here – whether for design (like Panasonic) or for film and television (like Viacom).

www.uktradeinvest.gov.uk

Key facts

Nearly 70% of international advertising agencies have their European headquarters in London.

UK fashion designers export 66% of the clothing they produce.

In 2008 UK films took 15% of the global box office, up 133% since 2002.

London has the largest revenue earning theatre cluster in the world.

Up until 2017, employment in the industry is projected to grow significantly, by some 150,000 more people, mostly in managerial, professional and highly skilled occupations.

Defence and security

The UK's technology base, skilled workforce and international links make it the ideal location for defence and security companies.

Defence and security

The sector

Defence is an integral part of the UK's economy, driving growth and creating the jobs of the future. It supports around 155,000 jobs, many of them highly skilled, with a further 110,000 people indirectly employed in the supply chain. The sector boasts a strong and vibrant supply chain with the capability to support the most advanced programmes. For example, over 100 UK companies are engaged in the supply chain for the US Joint Strike Fighter military aircraft.

The fast-growing UK security sector is one of the most diverse and technically advanced in the world, with exceptional strengths in counter-terrorism, border control, transport security, forensics, and chemical, biological, radiological and nuclear defence. The sector supports 18,000 companies, including many SMEs, and employs 335,000 people. UK companies have significant expertise in the security of sporting and other events, such as the Commonwealth Games and G20 Summit.

The market

The global defence market is growing. The export market (excluding domestic sales) rose from around £20bn in 2001 to £29bn in 2007 and the UK topped the list of defence exporters in 2007 with an unprecedented £10bn of new business, achieving a 33% global market share.

The global security market is currently worth around £120bn and estimated to reach £200bn in the next 10 years. There are opportunities to secure a considerable share of this growing market using UK expertise.

Opportunities

The UK is a world-ranking investor in defence R&D. It is a world leader in the development of the cutting edge technologies that will create the springboard for future growth. For example, there are opportunities to exploit our capabilities in autonomous systems and software and advanced sensors, in exciting new markets such as unmanned aerial vehicles (UAVs). The global UAV market is estimated to grow from around £2.7bn now to £3.7bn by 2016. If the UK achieves the same share in this market that it has currently in aerospace, it would contribute annual revenue of around £0.74bn by 2016, sustaining thousands of high value design and engineering jobs.

Progress

Significant progress has been made in implementing the Defence Industrial Strategy 2005 across the key industrial sectors. The DIS will be updated during the future Strategic Defence Review, in the light of future military capability requirements. The Government is already working closely with industry to address the complex technological and regulatory issues to allow UK airspace to be opened to UAVs. These include the need to develop robust and certifiable 'sense and avoid' systems and to ensure there is a dedicated bandwidth to provide secure communications between the UAV and the ground. The technologies developed to provide autonomous control of UAVs have the potential to spill over to sectors as diverse as automated transport systems, homeland security, robotics, manufacturing automation, healthcare and energy.

www.bis.gov.uk/defence
www.dso.uktradeinvest.gov.uk

Key facts

UK defence expenditure and exports support around 300,000 jobs in the UK.

Eleven out of the top 100 largest defence companies in the world are based in the UK and another 20 have operations in the UK.

The UK was the top global defence exporter in 2007, winning an unprecedented £10bn of new business and achieving a 33% global market share.

The UK security sector supports 335,000 jobs and is expected to grow by 7.7% by 2012, with strong growth predicted in CCTV, chemical, biological, radiological and nuclear defence and anti-terrorism services and equipment.

The global UAV market is forecast to grow from around £2.7bn now to £3.7bn by 2016, contributing annual revenue of around £0.74bn to the UK if the UK's share of the aerospace market is replicated.

Digital communications

Existing and emerging UK capabilities in digital communications like photonics and broadband are enabling the UK to prosper.

Digital communications

The sector

Digital communications benefit businesses by increasing productivity, facilitating innovation and improving access to new markets. Broadband can increase both capability and opportunity for business through e-commerce and high capacity telecommunications networks.
The development of broadband is underpinned by technologies in photonics and optical telecommunications.

The UK already has one of the most competitive and well-developed communications infrastructures in Europe but additional investment is supporting its continued advancement, creating jobs and delivering the latest communication technology to homes and businesses.

The market

Business and consumer demand for digital communications has transformed the sector in the space of a decade. The market has widened, in terms of numbers of users, and deepened, in terms of the level of service they expect.

There are more than 17 million broadband lines in the UK. On current trends this will rise to over 21 million lines by 2010. UK users spend more time online (34 hours per month) than users elsewhere in Europe (24 hours per month). We also spend more online – in 2008, internet sales stood at £222.9bn, representing 9.8% of the value of all sales of UK non-financial sector businesses.

Opportunities

The benefits of greater investment in digital communications would be felt right across the economy. NESTA has suggested that a nationwide rollout of superfast broadband could directly create 600,000 jobs, adding £18bn to GDP. Further independent estimates suggest a total investment of £5bn in next generation broadband from the private and public sectors could create an estimated 280,000 jobs in construction and maintenance alone.

The UK is at the forefront of optical communications technologies, which are the mainstay of all modern telecommunications core networks. Extending optical communications technologies to users' business premises will give exceptionally high speed and more reliable communications.

For individuals, better connectivity means greater consumer choice and the opportunity to use online public services. Nearly half of UK households can now access 50Mbps speeds through Virgin Media's network and BT is investing £1.5bn to bring next-generation broadband to 40% of homes by 2012. Companies such as H2O Networks and Independent Fibre Networks Ltd are also investing heavily to bring fibre to the home, offering the very fastest possible broadband services.

With broadband speeds rising, there is growing demand for components to handle ever greater bit rates and capacity. UK companies are already working on products capable of operating at speeds beyond 100Gb/s. These are based on leading edge Indium Phosphide technology, with Oclaro's advanced manufacturing facilities at Caswell and at the Centre for Integrated Photonics based at BT's Martlesham site, helping to keep the UK at the forefront of developments in global optical telecommunications.

Progress

The Government is investing up to £200m to ensure that virtually everybody will have access to 2Mbps broadband service by 2012, and a further £1bn in providing incentives to extend high speed next generation broadband access to 90% of homes by 2017.

www.bis.gov.uk/digitalbritain

Key facts

By 2012, £1 in every £5 of all new commerce will be online.

Each 10% increase in penetration of broadband is estimated to deliver a 1% increase in GDP.

There were 88 broadband connections per 100 people in the UK in 2008.

E-skills UK, the Sector Skills Council for Business and Information Technology, has suggested that 128,000 new jobs could be created if the IT and telecoms professions grow by an average of 1.3% each year until 2018.

NESTA has suggested that a nationwide rollout of superfast broadband could directly create 600,000 jobs, adding £18bn to GDP.

Digital services

The UK is a world leader in the development and use of web technologies.

Digital services

The sector

The digital and communications sectors are a vital part of Britain's future industrial strategy. They cover a broad range of industries including IT services, software development and networking and communications. As well as the economic significance, the digital sectors are recognised as being at the centre of the UK's social agenda and the importance of digital skills to the economy and in employment is well known.

The market

Already a major force in the UK economy, digital industries alone generate £86bn a year or 10.9% of the total UK economy and are growing in significance. The sectors also make a positive contribution to UK trade, with export in services in particular bringing in an estimated £1.4bn for April-June 2009 alone. The UK's digital sector will continue to grow in size and importance over the next decade. Around 27% of UK jobs are already ICT-related – more than France, Germany and the US.

Opportunities

It is in the innovative application of ICT where the UK excels. Many global firms source their corporate communications projects in the UK. This will grow even more with the switch of advertising from press and TV to the internet and mobile channels.

The UK is also a leading player in the future of the internet. Next generation technologies are using semantic approaches to catalogue information and compile more accurate and personalised responses to information queries, essential given the increasing volume of data on the internet. An example of what is possible through this semantic web has just been launched in the UK so, at the click of a mouse, firms can identify where the expertise lies in technologies such as plastic electronics, regenerative medicine and advanced composite materials.

Cyber security is another major area of future growth that the UK is aiming to capitalise on. The semantic web provides the opportunity to create a seamless online bank of all your data, both personal and business. And by 2013 mobile devices will overtake PCs as the most common web access device worldwide. This means security becomes even more important and innovative solutions need to be found.

The UK already has some leading developments in cyber security. One example is the £30m Centre for Secure Information Technologies at Queen's University, Belfast, which will become the UK's principal centre for the development of technology to counter malicious cyber attacks and a vital reference point for all businesses working in the field and beyond.

Progress

The Government is taking further action to realise its vision for Digital Britain. Government is investing nearly £8m in the development of a National Skills Academy for IT, which will be launched later this year to ensure that business gets exactly the skills that they need. The UK has world leading research centres in machine intelligence, autonomous systems and man-machine interface. These will transform operations in fields as diverse as aerospace, pharmaceuticals, finance, communications, transport and energy management, as well as new growth sectors such as assisted living and care for the elderly.

www.uktechnology.info
www.ukinvest.gov.uk/ICT/en-GB-list.html

Key facts

UK citizens are among Europe's most enthusiastic technology consumers, spending an estimated £118bn on ICT products and services in 2009.

UK consumers make an estimated £50bn worth of online purchases each year – the most lucrative eCommerce market in Europe.

The software engineering sector is predicted to grow by 2% a year, leading to an increase of 67,000 jobs by 2018.

It is estimated that the continued adoption and exploitation of ICT could generate an additional £35bn to the UK economy over the coming five to seven years.

Industrial biotechnology

Industrial biotechnology offers huge opportunities to revolutionise the chemicals industry, delivering tremendous environmental as well as economic benefits.

Industrial biotechnology

The sector

Industrial biotechnology uses biological resources such as plants, algae, fungi and micro-organisms for industrial purposes. It can contribute significantly to achieving a low-carbon economy, and could help to reduce between 1 and 2.5 billion tonnes of greenhouse gas per year by 2030. Advances in industrial biotechnology will help to redefine chemical manufacture in the 21st century and have an impact on manufacturing sectors as wide ranging as fibre-based materials for the construction industry to biolubricants, chemical building blocks, biodiesel and pharmaceutical products.

The market

The global industrial biotechnology market is currently worth about £35-53bn with the potential to achieve global sales of £150-360bn by 2025 in the chemical sector alone.

Opportunities

The UK is well placed to take advantage of these future market opportunities. We are among the world's leaders of industrial biotechnology research with strengths in both business and academia (especially in biocatalysis, fermentation, plant and marine science).

The UK has already demonstrated strengths in key areas of industrial biotechnology such as biocatalysis and fermentation and gained advantage in the cost and efficiency of innovations such as semi-synthetic penicillins and anti-viral agents, novel plant oils for skin care, flavours and fragrances.

Newer developments include the use of fast-track breeding technology to reduce the cost and help secure supply of an anti-malarial drug in medicinal plants, the discovery of new bioactive compounds such as drug resistant antibiotics and industrial products from marine microbes. In the future, the production of chemicals from renewable bio-based feedstocks will be vital to reduce dependence on fossil fuels and achieve climate change goals.

Progress

The UK's strong chemical and biosciences sectors will be working together to capture these opportunities. To help with this, the Government is investing £12m in a unique new open-access scale-up demonstration facility at Wilton which will be fully operational by the end of 2010, offering companies advice, research and facilities. The Government is also providing £2.5m to explore how industrial biotechnology can be competitively applied to manufacturing high value chemicals. They are part of the strategy to exploit that growing market, and will result in commercial-scale activities and spin-off companies within one or two years, creating new, high quality job opportunities, including chemists, biologists and engineers.

www.bis.gov.uk/advancedmanufacturing

Key facts

The UK chemicals sector is the seventh largest producer globally with annual sales of £56bn, representing 11% of all UK manufacturing.

It employs 170,000 people directly, several hundred thousand jobs depend on it, and it generates £10.5bn of value added with a net export surplus of £6.5bn.

UK industrial biotechnology chemical sales are projected to grow by between 5% and 11% per annum, up to £12bn in 2025.

The UK is one of the world leaders in research into processes using plants, microbes and algae (biocatalysis, metabolic pathway engineering and fermentation process technology).

Life sciences

Life sciences is a high tech, innovative industry with the potential to transform healthcare in the future.

Life sciences

The sector

The life sciences industry in the UK employs over 120,000 people, with major potential for further growth and job creation over the next decade. Through the development of innovative medicines and medical technologies, the industry contributes to the delivery of high-quality healthcare which is transforming people's health and wellbeing.

The market

The UK pharmaceutical sector employs some 67,000 people and has annual sales of around £15.6bn. The medical biotechnology sector employs 24,000 people and has a combined annual turnover of around £4.2bn. The medical technology sector employs 52,000 people and generates around £10.6bn of turnover.

Opportunities

In the coming decades, an ageing population and greater public expectations of fast, effective treatment will pose increasing challenges to healthcare systems. This will drive development in healthcare products and services, with global growth forecast at 7-12% annually. The UK life sciences industry will make an important contribution to meeting these challenges, both within the UK and globally, through cutting-edge technologies and export opportunities.

Regenerative medicine is just one innovative area of UK expertise, which is predicted to grow and create new job opportunities. Regenerative medicine has the potential to cure chronic conditions such as stroke, diabetes and blindness through the replacement or regeneration of human cells, tissue or organs to restore or establish normal function.

Ranking in the top three countries world-wide, the UK is at the cutting-edge of regenerative medicine. For example, UK-based stem cell company ReNeuron is a world-leader in regenerative medicine and is about to start the first ever clinical trial in Glasgow using expanded brain stem cells to treat stroke patients. These stem cells have the potential to address the underlying causes of stroke by stimulating the brain to repair itself naturally.

Progress

The Government is taking steps to ensure the economic and healthcare benefits of regenerative medicine are realised. Significant UK growth is projected in the next decade with sales of £5bn and 15,000 jobs in research and high-value manufacturing. There are a number of barriers to growth in regenerative medicine which the Government is working to address. The *RegenMed* programme, supported by £21.5m investment, will fund high-quality studies, giving fledgling companies access to finance and providing evidence of clinical effectiveness. The *remedi* programme is supporting the development of industrial infrastructure needed to manufacture regenerative medicine therapies, building unique UK capabilities that will attract overseas investors.

These actions form part of wider Government work to transform the UK environment for life sciences. Recently announced measures include: a UK Life Sciences Super Cluster, an Innovation Pass, to give earlier patient access to innovative medicines, and a Patent Box which will, from 2013, apply a 10% rate of corporation tax to income from patents to incentivise investment in life sciences and other innovative industries.

www.bis.gov.uk/ols

Key facts

The UK pharmaceutical sector is the leading UK sector for investment in R&D, investing £4.3bn in 2008, which represents over a quarter of all business R&D expenditure in the UK.

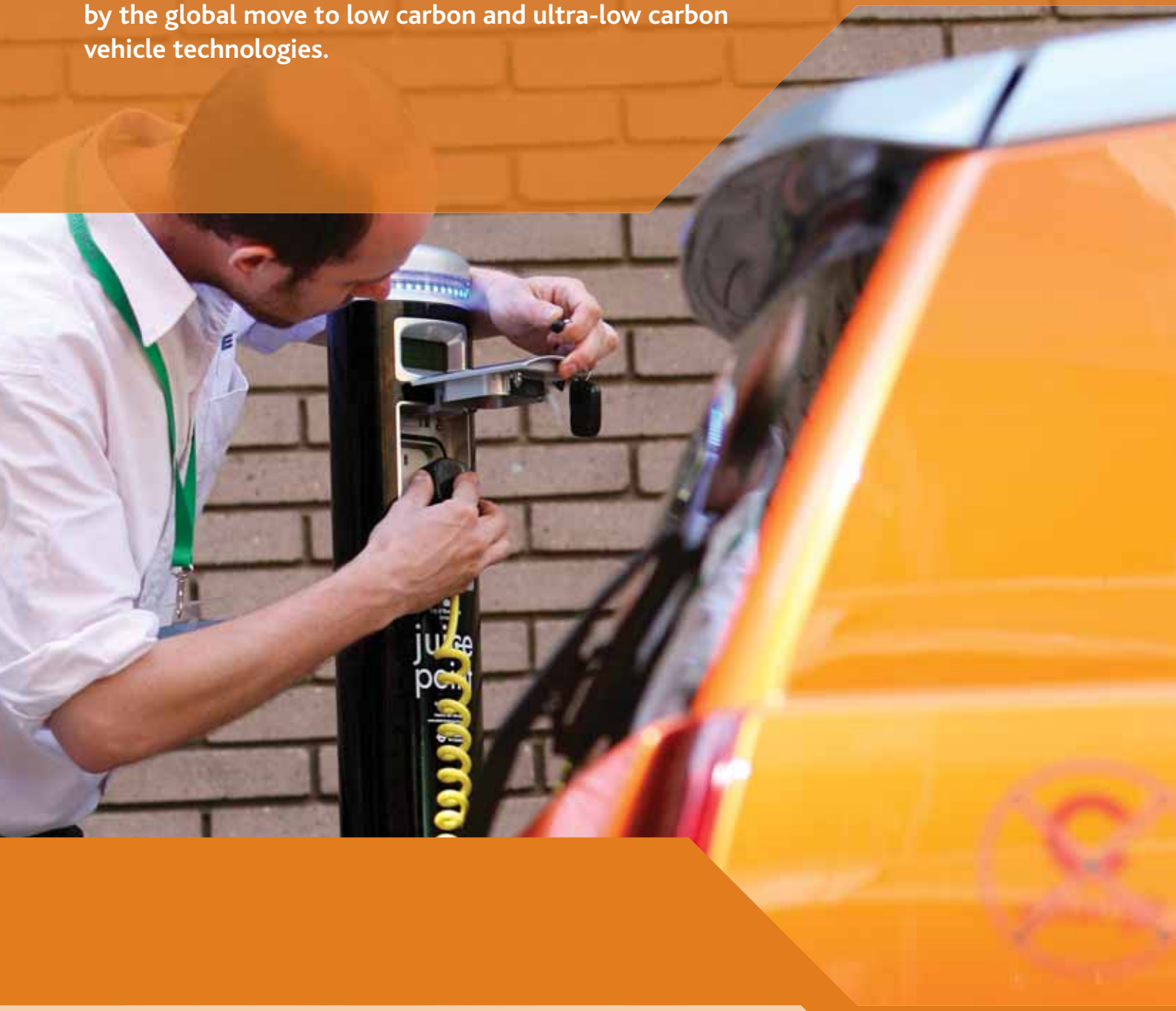
The UK medical biotechnology sector leads Europe in the number of drugs in all stages of clinical development.

Around 25% of all European medical technology companies are based in the UK.

Significant UK growth in regenerative medicine is projected in the next decade with sales of £5bn and 15,000 jobs in research and high-value manufacturing.

Low carbon automotive transport

The UK automotive industry is poised for re-invigoration by the global move to low carbon and ultra-low carbon vehicle technologies.



Low carbon automotive transport

The sector

The global automotive industry is in transition. Millions of ultra-low carbon cars will join the world's roads in the coming decades and the trend for more carbon-efficient conventional vehicles will continue. Changing the way we power and use our cars will help tackle the 20% of CO_2 emissions that come from road transport. It is also a massive opportunity for business and the UK.

The market

Innovation, design and engineering are at the heart of the UK automotive industry and the industry continues to invest in its future, with over £1bn spent on R&D in the UK every year by household names like Jaguar, Lotus and Ford. Strategic support for the transition to low carbon can increase the £10bn added to the economy each year and secure the 180,000 jobs in the UK auto manufacturing industry.

Opportunities

The next 20 years will see the internal combustion engine remain dominant but becoming more efficient and increasingly combined with other technologies, now seen in demonstration vehicles and niche markets. The UK must seize the opportunity to progress these technologies through to the mass market. For example, the world leading UK motor sport industry has pioneered the use of energy recovery systems, expertise which is now being applied to regenerative braking systems in hybrid and electric vehicles.

As a world leading centre for engine design and production, the UK is already adjusting to meet changing patterns of demand. A prime example is Ford's ECOnetic range of Duratorq turbo diesel engines, developed at the UK's Dunton Research and Engineering Centre. Combined with other developments, these engines deliver best in class CO_2 performance. The strategic opportunity is for UK expertise in conventional powertrains to translate to success in developing and manufacturing the powerpacks of the future.

Batteries are another major growth area, with lithium-ion chemistries the front-runners to power ultra-low carbon vehicles. Already the UK employs over 2,000 people in its wider battery industry, boasts Europe's largest independent supplier of lithium-ion batteries and last year Nissan chose to invest £200m in the UK to build its first battery plant outside of Japan. The UK can lead the way in new battery cell designs, chemistries and management systems.

Progress

Developing and using vehicles that plug in to the electricity grid will require unprecedented co-operation both across business sectors and between Government and industry. The UK auto industry has been offered a stronger strategic voice than ever through the joint ministerial and industry-led Automotive Council.

The timely delivery of Government support to the industry is critical and it is happening now. Three lead locations in the UK are being supported by the Government to deploy a critical mass of 11,000 charging points; the largest demonstration of ultra-low carbon vehicles of its kind in the world is underway; and from January 2011 motorists will receive up to £5,000 off the cost of an ultra-low carbon car. The UK Government has a clear vision and has committed over £450m towards placing the UK at the global forefront of the development, demonstration, manufacture and use of ultra low carbon vehicles.

www.dft.gov.uk/olev
www.bis.gov.uk/automotive

Key facts

The market for lithium ion batteries has been predicted to grow to £28bn by 2020.

The next 20 years will see over £150bn invested in low and ultra-low carbon vehicle technologies.

Eleven global vehicle makers have a significant presence in the UK and 19 of the world's top 20 suppliers are based in the UK.

In 2009 more than 2 million engines were produced in the UK – more than twice the number of assembled vehicles.

Low carbon energy

The UK has become a global hub for renewable energy development and a significant player in the civil nuclear market.

Low carbon energy

The sector

To tackle climate change, the UK needs to move to a low-carbon energy supply in the coming years. This will require new technologies and create new markets. With excellent renewable energy resources, a strong skills base and Government commitment to growing the sector, the UK stands to benefit hugely from this shift.

The market

The UK renewable energy sector is already well established, with an estimated market value of £33bn in 2008/09 and employing over a quarter of a million people. The sector is set to grow rapidly, reaching an average growth rate of over 5% by the middle of the decade. Nuclear power had a market value of £3.7bn in 2008/09 and growth is forecast to rise from 2.6% in 2008/09 to 4% by the middle of the decade.

Opportunities

One of the key areas of growth is offshore wind. Britain is the largest single market for offshore wind in the world and has the potential to produce 32GW of offshore wind energy in its waters by 2020 – a huge increase on current levels of less than 1GW. There will be real prospects for UK companies to supply this market, creating up to 70,000 UK jobs in the process. The Government is determined to ensure that the UK takes advantage of these opportunities in this challenging sector, supporting the development of technology with the creation of world-leading testing facilities in the UK.

The UK's marine energy resource is the largest in Europe and has made us a global leader in the development of wave and tidal energy technologies. Pelamis Wave Power is just one business that is benefiting from this buoyant and emerging sector, developing the world's first commercial scale machine to generate electricity to the grid from offshore wave energy. With support from the Government's Marine Renewables Proving Fund, Pelamis is now developing a second generation machine that incorporates a number of major technical innovations to improve manufacturability and enhance economic performance.

Low carbon energy is not confined to renewables. New nuclear energy will be a vital part of the energy mix and the market is already experiencing a renaissance around the globe. Fifty-three reactors are currently under construction worldwide and over 300 more are proposed. This massive new build programme, alongside the decommissioning or lifetime extension of 75% of the world's reactors currently in operation, will provide significant commercial opportunities for UK industry, creating up to 10,000 highly skilled engineering jobs in the construction of every new reactor in the UK.

Progress

Over £60m of Government funding for the offshore wind industry is providing state-of-the-art blade testing facilities and has helped attract major offshore wind developers, such as Clipper Windpower and Mitsubishi to base their operations in the UK.

Vital public investment is being made in marine energy research, testing and demonstration facilities such as Wave Hub, the world's largest test site for marine energy devices. This flagship marine energy project will create a grid-connected 'socket' on the seabed some 10 miles off the north coast of Cornwall, to which groups of wave energy devices can be attached, tested and monitored in real conditions.

To capitalise on Britain's long heritage in nuclear power, the Government is providing a range of public support to the nuclear industry. This includes £33m towards an industry-led research centre, as well as strategic investments with key companies such as Rolls Royce to develop the capability and competitiveness of the nuclear manufacturing supply chain in the UK.

www.hmg.gov.uk/lowcarbon

Key facts

The UK Government has set a legally binding commitment to get 15% of our energy from renewable sources by 2020.

The low carbon and environmental sector in the UK is worth an estimated £112bn and employs 910,000 people. Under current growth projections it could employ well over one million people by the middle of this decade.

Offshore wind has the potential to employ up to 70,000 workers in the UK by 2020, bringing £8bn annual revenues to Britain.

The UK is paving the way for an emerging carbon capture and storage sector that could sustain up to 60,000 jobs by 2030.

Plastic electronics

The UK is already a global leader in plastic electronics – an emerging sector with huge long-term potential.

Plastic electronics

The sector

Plastic electronics is a technology that enables circuits to be printed onto a range of surfaces. This technology will lead to the creation of a whole new generation of innovative products that can be produced more cheaply and in a more environmentally friendly way than previously viable. Potential new products will include large area ultra-efficient lighting panels; low cost solar cells that can be integrated into buildings; and intelligent packaging that provides protection against counterfeiting or responds to changes in products that have exceeded their shelf life.

The market

The global market for plastic electronics is forecast to rise from £1bn today to £80bn by 2020. This rapid expansion will create up to 20,000 jobs in the UK and generate a wealth of economic opportunities.

Opportunities

The UK is already a world leader in developing plastic electronics and aims to remain this way. For example, the company Cambridge Display Technology, which spun out of the University of Cambridge in the mid 1990s, is now at the forefront of materials development. It is producing light-emitting polymers and leading the world in the development of organic light emitting diode displays, which are much brighter, lighter and more efficient than plasma or LCD.

In processing and manufacturing, equipment like Plasma Quest's thin film deposition kit enables plastic film to be coated much faster and at lower temperature and cost than other techniques. And in device design and prototype manufacture, Plastic Logic raised over £150m of venture capital finance to develop its plastic electronics products, and launched the world's first professional electronic reading device, 'eReader', with a plastic electronic backplane in January 2010. Future developments of this product will enable ultra lightweight, flexible eReaders to be created that come a stage closer to realising the dream of fully flexible electronic paper.

Progress

The UK's Research Councils are currently investing £68m in funding for university projects, while the Technology Strategy Board has invested more than £52m in conjunction with business in over 50 collaborative projects since 2004. To hasten the exploitation of plastic electronics, a £20m expansion of one of these centres, the Printable Electronics Technology Centre (PETEC) in the North East of England, will be completed in March 2011, creating a national state-of-art open-access plastic electronics prototyping facility.

www.bis.gov.uk/advancedmanufacturing

Key facts

The global market for plastic electronics products is forecast to rise to £80bn by 2020.

There could be as many as 20,000 jobs created throughout the plastic electronics supply chain by 2020.

The recent investment of £20m into the Printable Electronics Technology Centre (PETEC) will enable the establishment of a world-class open access, plastic electronics prototyping facility in the North East of England.

Space

From research to advanced manufacturing, the UK has world-class capability in space that will deliver real benefits to consumers.

Space

The sector

The UK's broad science base for space is second only to the US. We are global leaders on software design, systems integration and satellite operations. Britain has the skills, capabilities and facilities that enable us to manufacture entire payloads for around one-quarter of all large telecommunications satellites and dominate the small satellite market.

The market

Space is currently worth £5.6bn a year to the UK economy and supports 68,000 highly-skilled jobs. Recent economic analysis shows that the UK space sector has grown on average by 9% each year. Demand for UK products and services in the space sector has been unaffected by the recession. The global space market is forecast to be worth at least £400bn by 2030.

Opportunities

Demand will continue to grow as space-based communications deliver new services such as superfast broadband, mobile internet, and high-definition and 3D TV. We can expect a 20-fold increase in bandwidth compared to existing satellites, meeting the needs of rural communities in this country as well as in overseas markets.

Galileo, a new EU global satellite navigation system, will provide enhanced satellite navigation signals that are accurate to a one metre range. This will be important in the development of next generation integrated applications such as automatic caller location to the emergency services. Surrey Satellites are a major part of the consortium building the Galileo satellites themselves.

In 20 years, space could offer 'internet data centres' in orbit that are not only able to provide a more efficient service for consumers but also significantly reduce carbon emissions within the earth's atmosphere. Earth observation is another growth area, as demand for security and climate-change monitoring and mitigation services increases.

Progress

To capitalise on the opportunities, the UK space industry has produced a 20 year innovation and growth strategy to capture 10% of that market, creating 100,000 UK jobs in the process. The Government is working with industry to determine how this growth plan can be delivered.

UK companies are already working on next generation technologies, like small-satellite sensors and platforms which offer highly cost-effective means of gathering earth observation data. They are also developing technologies for 'single stage to orbit' space planes, developments that can also capitalise on the UK's lead in autonomous avionics and composite structures, to reduce the cost and risk of launching satellites.

Government provided £268m for space programmes in 2008/09, three-quarters of which was used to support European space programmes through the European Space Agency. In recognition of the sector's importance and unique characteristics for the economy and science, the UK will set up a space agency to deliver its domestic and international space policy.

The space innovation and growth strategy is available at **www.SpaceIGS.co.uk**

Key facts

The UK space sector has grown year-on-year for the past decade.

The global space internet market could be worth £29bn a year by 2030.

The global market for environmental monitoring and security data from space could be worth up to £150bn a year by 2030.

The space sector could create 100,000 new UK jobs by 2030.

UK TRADE & INVESTMENT

UK Trade & Investment (UKTI) is the government organisation that helps UK-based companies succeed in the global economy. We also help overseas companies bring their high quality investment to the UK's economy – acknowledged as Europe's best place from which to succeed in global business. UKTI offers expertise and contacts through its extensive network of specialists in the UK, and in British embassies and other diplomatic offices around the world. We provide companies with the tools they require to be competitive on the world stage.

www.uktradeinvest.gov.uk

BIS | Department for Business Innovation & Skills

The Department for Business, Innovation and Skills (BIS) is building a dynamic and competitive UK economy by: creating the conditions for business success; promoting innovation, enterprise and science; and giving everyone the skills and opportunities to succeed. To achieve this it will foster world-class universities and promote an open global economy. BIS – Investing in our future.

www.bis.gov.uk